SP Energy Networks

Dun Law Wind Farm – Grid Connection

Routeing and Consultation Document

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01.
Introduction

1. Introduction

1.1 Introduction

This Routeing and Consultation Document (RCD) has been prepared by AECOM on behalf of SP Energy Networks (SPEN)[1] as part of the development of a new double circuit 132 kilovolt (kV) overhead line (hereafter referred to as the 'Grid Connection') connecting the existing Dun Law Wind Farm (DLWF) in the Scottish Borders to the electricity transmission system.

The Grid Connection will comprise a new double circuit 132kV overhead line (OHL) carried on steel lattice towers (also referred to as pylons) from DLWF to the proposed Gala North Substation and then onwards to a steel lattice tower on the new 132kV Galashiels to Eccles OHL north of Langlee, Galashiels. From this tower the Grid Connection will be connected to Galashiels Substation using existing underground cables.

Figure 1 at the end of this section illustrates the location of DLWF and the electricity transmission system as well as the 'start' and 'end' points for the Grid Connection. As part of the Grid Connection, the existing 132kV OHL which connects DLWF to the transmission system between Smeaton, Dun Law and Galashiels (known as 'P route') will be removed.

The RCD explains the background to the Grid Connection and describes the approach to and results of a routeing study, the first stage in the development of the Grid Connection. The objective of the routeing study described within this RCD has been to identify and assess alternative route options for the Grid Connection and identify a preferred route option to be taken forward.

1.2 SP Transmission's Statutory Duties and Licence Obligations

SP Transmission plc (SPT), the Transmission Owner (TO) and Licence Holder under the Electricity Act 1989 ('the Act'), is responsible for the electricity transmission network in central and southern Scotland including in the Scottish Borders where DLWF and the Grid Connection are located.

As the holder of a transmission licence under the Act, SPT is subject to a number of statutory duties and licence obligations. These include requirements "*to develop and maintain an efficient, coordinated and economical system of electricity transmission*" and

[1] SP Energy Networks (SPEN) is the trading name for Scottish Power Energy Network Holdings Limited. SPEN owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly-owned subsidiaries SP Transmission plc and SP Distribution plc. These businesses are 'asset-owner companies' holding the regulated assets and Electricity Transmission and Distribution Licenses. SP Transmission plc is the transmission licensee.

"*to facilitate competition in the generation and supply of electricity*". This requires SPT to provide for new electricity generators such as wind farm developers wishing to connect to the transmission system in its licence area; to make its transmission system available for these purposes and to ensure that the transmission system is fit for purpose through appropriate reinforcements to accommodate the contracted capacity.

In addition, in formulating proposals for electricity transmission infrastructure, SPT is subject to duties under Schedule 9 of the Act: "*(a) to have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and, (b) to do what it 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.*"

SPEN, acting on behalf of SPT, is undertaking further studies including this routeing study to connect DLWF to the electricity transmission system. This work is undertaken in accordance with SPT's statutory duties and licence obligations with the objective of ensuring that the Grid Connection is technically feasible, economically viable and on balance, causes the least disturbance to both the environment and the people who live, work and enjoy recreation within it.

1.3 Need for the Grid Connection

The UK and Scottish Governments have set legally binding targets to reach net zero in greenhouse gas emissions and end their contributions to climate change by 2050 and 2045 in the Climate change Act 2008 and Climate Change (Scotland) Act 2009 respectively. Decarbonisation of the energy sector is a central pillar of both governments' net zero strategies meaning the way in which energy is generated, transported and used is undergoing transformational change. Traditional fossil fuel-based forms of generation are being retired and replaced by renewable and low carbon sources of energy generation including onshore wind. This includes developing new onshore wind farms, or in the case of DLWF extending the life of existing ones by re-powering them with new wind turbines.

The operators of DLWF are developing proposals to re-power the existing wind farm and increase its installed capacity from 30 to 156 megawatts (MW). As part of this they have a contract with National Grid Electricity System Operator (NGESO) and SPT to provide a new connection to the electricity transmission system which will accommodate the increase in installed capacity. Due to the significant increase in capacity the existing OHL which connects DLWF to the electricity transmission system cannot be utilised and a new OHL grid connection is required.

1.4 Development and Consenting of the Grid Connection

The approach taken to developing the Grid Connection comprises the following key phases:

- Phase 1. Routeing. Phase 1 comprises this routeing study in which alternative route options for the Grid Connection are identified and assessed taking into account a range of environmental, technical and economic considerations in line with SPT's

statutory duties. It concludes with the identification of a preferred route option for the Grid Connection which is then subject to consultation (referred to as Phase 1 Consultation). SPEN is committed to ongoing consultation with interested parties, including statutory and non-statutory consultees and local communities. Whilst there is no statutory requirement to consult during the early routeing stages, SPEN consider it good practice to introduce consultation at this stage. Responses to consultation will be evaluated and inform confirmation of a proposed route to be taken forward to Phase 2.

- Phase 2. Environmental Impact Assessment (EIA). The Grid Connection will require to be subject to EIA under the Electricity Works (EIA) (Scotland) Regulations 2017. Through Phase 2 the EIA process seeks to identify, assess and mitigate the likely significant adverse effects of the Grid Connection on the environment. The EIA process comprises several steps starting with scoping and concluding with the production of an EIA Report (EIAR) which will accompany the application for consent. During this phase SPEN will also undertake a second round of public consultation (referred to as Phase 2 Consultation) on the detailed design of the grid connection.
- Phase 3. Application for Consent. SPEN will be applying to the Scottish Ministers for consent under Section 37 of the Electricity Act 1989, as amended, to install, and keep installed, the Grid Connection. The EIAR will accompany the application for Section 37 consent. At the same time, SPEN will also apply to Scottish Ministers for deemed planning permission under Section 57(2) of the Town and Country Planning (Scotland) Act 1997, as amended, for the Grid Connection including ancillary development. While the Scottish Ministers will be responsible for the decision to approve the Grid Connection or not, in reaching their decision they will consult with statutory stakeholders and members of the public.

1.5 Purpose and Structure of this Document

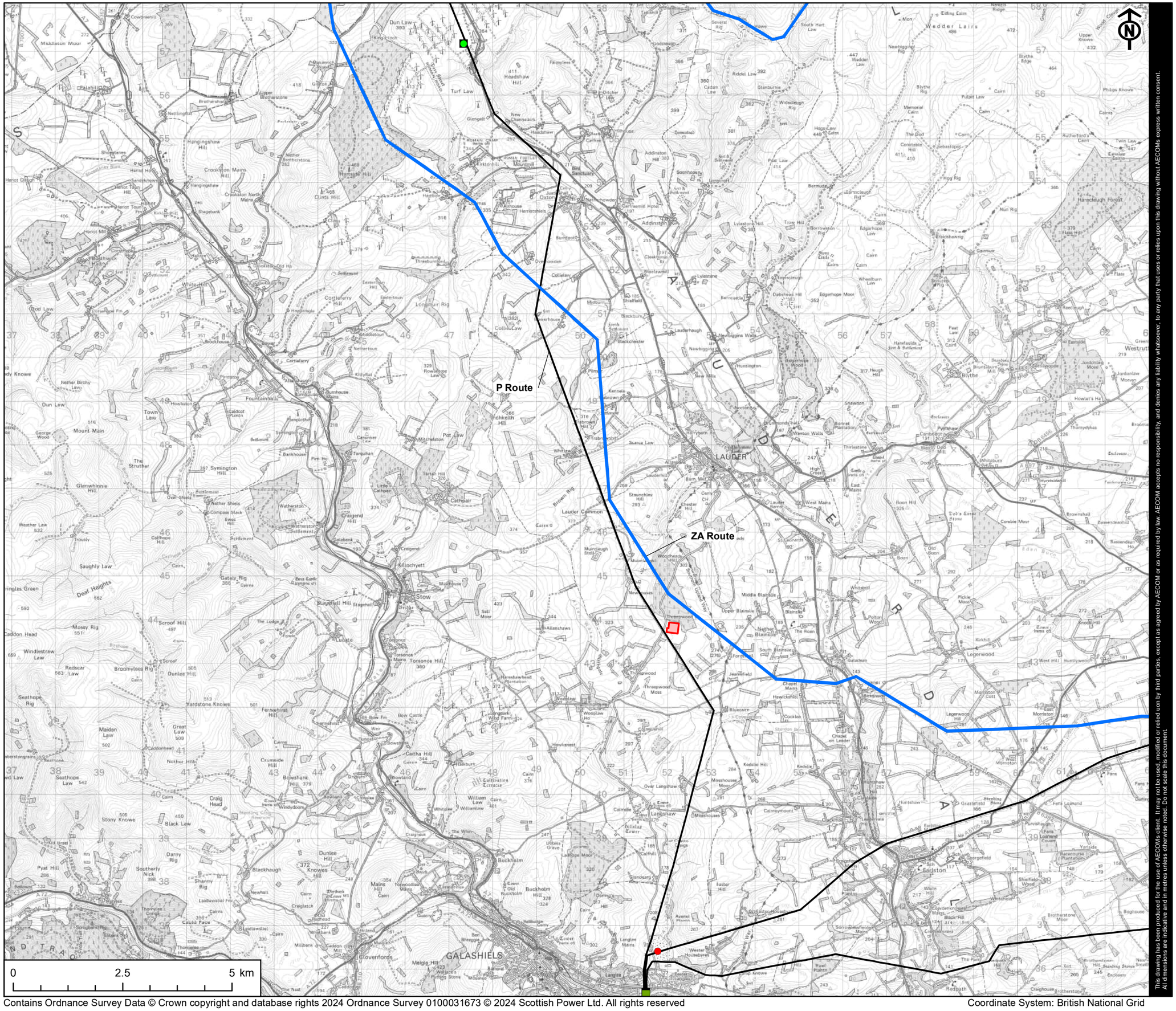
The primary purpose of this RCD is to report on Phase 1 of the Grid Connection; the routeing study which has been undertaken in order to identify a preferred route option. The RCD has been published in parallel with the start of public consultation on the Grid Connection. The objective of this is to seek feedback on the preferred route option from statutory and non-statutory consultees, as well as local communities and use this feedback to inform subsequent stages of the development and assessment of the Grid Connection ahead of making the relevant consent applications.

The structure of the RCD is set out below in Table 1. It describes the approach taken to identifying and assessing alternative route options in a clear, systematic manner in accordance with SPT's statutory duties and licence obligations and taking into account industry-recognised approaches to the routeing of OHLs.

Table 1 Routeing and Consultation Document Structure

Section	Description
1. Introduction	Provides an introduction to the Grid Connection, SPT's statutory obligations and an outline of the purpose and structure of the RCD.
2. Description of the Grid Connection	Provides an overview of the Grid Connection and its key physical components including details of construction requirements.
3. Approach to Routeing	Describes SPEN's general approach to the routeing following established practices and sets out the approach to the Grid Connection.
4. The Study Area	Identifies and describes the Study Area in which the routeing study is undertaken as well as key constraints or features within it.
5. Routeing Strategy and Assessment of Route Options	Describes the Routeing Strategy applied specifically to the DLWF Grid Connection and the identification and assessment of alternative route options.
6. The Preferred Option	Identifies and describes the preferred route option including the reasons for its selection.
7. Consultation and Next Steps	Describes the key next steps in the grid connection including consultation on the preferred route option and how to provide feedback.

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



Coordinate System: British National Grid

AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

TITLE
Figure 1
Overview of the Grid Connection

REFERENCE
DL_20240611_RR_1_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

02.
Project Description

2. Project Description

2.1 Introduction

This section provides a brief description of the infrastructure which would be required for the Grid Connection. As described in the previous section, the Grid Connection comprises a new 132 kV OHL from DLWF to the proposed Gala North Substation located 3.5km south west of Lauder (which will subject to a separate planning application to Scottish Borders Council) and then onwards to an OHL tower on the new 132kV Galashiels to Eccles OHL approximately 500m north of Langlee, Galashiels where the Grid Connection will terminate. From the tower, the Grid Connection will be connected to Galashiels Substation using existing underground cables. It should be noted that given the early stage in the Grid Connection's development, the information contained in this chapter is not confirmation of a final design, however, it is considered appropriate for the purposes of the routeing study and to inform the Phase 1 Consultation.

2.2 Grid Connection Requirements

DLWF is currently connected to the electricity transmission system by an existing 132kV OHL (known as 'P route') from the wind farm substation located to the west of the A68. This connects DLWF to Smeaton Substation approximately 18km to the north and to Galashiels Substation approximately 23km to the south. As DLWF is being repowered, it means that the existing route (known as 'P Route') cannot be utilised for the purposes of the Grid Connection. This is because P route would not be capable of carrying the amount of power generated by re-powered DLWF. As a result, a new double circuit 132kV OHL is required to replace the existing OHL and connect the re-powered DLWF to the electricity transmission system. The existing P route from Smeaton to Galashiels will be dismantled when the new Grid Connection is constructed and energised.

2.3 The Grid Connection

Key Elements

The Grid Connection will comprise the following key elements:

- A new double circuit 132kV OHL carried on steel lattice towers from DLWF to the new Galashiels to Eccles 132kV OHL via the proposed Gala North Substation.
- Construction of an extension of the existing DWLF substation located approximately 350m west of the A68.
- Establishment of a sealing end compound close to Gala North Substation where the OHL will be undergrounded and connected to the Substation.
- OHL works to connect the Grid Connection to a tower on the new Galashiels to Eccles 132kV OHL 500m north of Langlee, Galashiels.

- Removal of the existing 132kV OHL (P route) between Smeaton, Dun Law and Galashiels upon energisation of the Grid Connection.

Overview of an OHL

OHLs transmit electricity by conductors (or wires) which are suspended at a specified height above ground and supported by wood poles or steel lattice towers, spaced at intervals. The conductors can be made of aluminium or steel strands. Most OHLs operating at 132kV and above carry two 3-phase circuits, with one circuit strung on each side of a tower. An earth wire may also be required to provide lightning protection. The conductors are strung from insulators attached to the lower cross-arms and prevent the electric current from crossing to the tower.

Tower Type, Height and Span Length

The Grid Connection will be carried on steel lattice towers. While the final tower model is subject to detailed design it is expected that the Grid Connection will be carried on L7 steel lattice towers. A typical L7 tower is shown in Figure 2. There are three types of tower which may be required at various points along the Grid Connection route:

- Suspension or Line Tower: these typically form most of an OHL route and are used where the tower is part of a straight-line section of the OHL route;
- Tension or Angle Tower: these are used where an OHL route changes direction where there is a horizontal or vertical deviation. There are three main types of angle tower:
    - 30 degrees,
    - 60 degrees and
    - 90 degrees.
- Terminal Tower: these are used when an OHL terminates at a substation or on to an underground cable section via a separate cable sealing end compound or platform.

The L7 steel tower has a standard design height of 30m, however, this can vary from 27m to up to approximately 42m according to the electrical safety clearance to the ground, which may be a factor when crossing areas such as roads or raised areas of ground.

The distance between adjacent towers, known as the ‘span length’, is approximately 200-300m. The exact span distance will depend on site specific constraints or obstacles.

Steel towers are constructed from galvanised steel and typically grey in colour which becomes duller over time (approximately 18 months). The shade of grey is not distinguishable at distance and normally appears as grades of light and dark. Where towers are viewed against the sky, colour cannot be relied upon to diminish visibility, since the lighting characteristics of the sky vary greatly.

2.4 Typical Construction Requirements

The construction of OHLs follows a well-established process. As well as the OHL it also requires additional temporary land-take and infrastructure, for example temporary

accesses to tower locations and temporary construction compounds to store materials. Key phases of construction comprise the following activities:

- Tree felling or lopping (where required);
- Preparation of accesses;
- Excavation of foundations;
- Tower delivery;
- Erection of towers;
- Delivery of conductors and stringing equipment;
- Insulator and conductor erection and tensioning; and
- Clearance and reinstatement.

The total duration of construction activity at any single tower site is approximately two weeks for tower foundations, one to two weeks for tower construction, and up to four weeks for conductor erection and stringing depending on the size of the tower and the number of the conductors to be strung. These periods are spread over about four months, with periods of inactivity between, or longer if construction difficulties are experienced elsewhere along the route or ground conditions prevent normal progress.

Prior to constructing the OHL, temporary accesses will be constructed, as necessary, and laydown /storage areas established, usually mid-way along the route. Any trees which may impact on safety clearances will be removed or lopped. Following commissioning of the OHL, all equipment and temporary access of construction areas will be removed with the land being reinstated to its former use/condition.

2.5 Operation and Maintenance

OHLs require minimal maintenance. The condition of tower steelwork and foundations is monitored regularly, periodic painting of the tower steelwork may be required, and components are regularly inspected for corrosion, wear and deterioration. Towers which have deteriorated significantly may be dismantled carefully and replaced. There is also an ongoing requirement to ensure that any vegetation within proximity to the OHL does not impact on safety clearances.

2.6 Decommissioning

If an OHL line is to be decommissioned, steel towers will be removed with components re-used where possible. Foundations are removed to a minimum depth of approximately 1m below ground level, the area around the base of the tower is cleared and the ground reinstated.

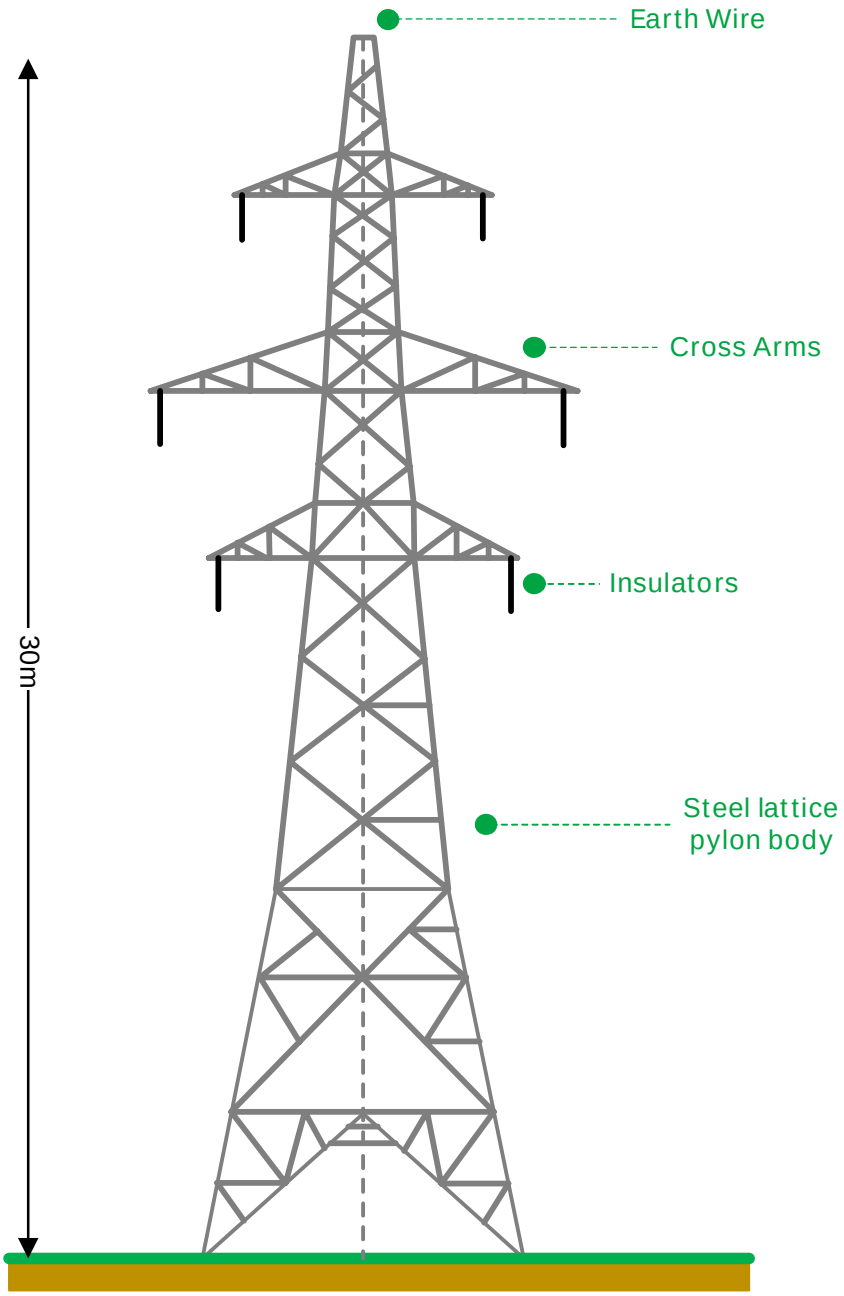


Figure 2 Proposed L7 Tower Model

03.

Approach to Routeing and Siting

3. Approach to Routeing and Siting

3.1 SPEN's Approach to Routeing

In 2015, as part of a wider industry review involving Government and the Office of Gas and Electricity Markets (Ofgem), SPEN reviewed its approach to routeing. This review concluded that the requirement to balance statutory duties and licence obligations comprising economic, technical and environmental factors continues to support the development of an OHL in most circumstances. However, SPEN also concluded that there are certain circumstances in which development of an underground cable (UGC) should be considered.

SPEN undertook a further review of their approach in 2020 as part of preparing their RIIO-T2[2] Business Plan which reaffirmed these conclusions. As part of the review SPEN consulted on and published an updated version of '*Major Infrastructure Projects: Approach to Routeing and Environmental Impact Assessment*'[3] which describes their general approach to routeing new electricity transmission infrastructure.

The basic premise of the approach set out by SPEN is that the main effect of an OHL is visual and that the degree of visual impact can be reduced by careful route selection; for example by using topography and trees to provide screening and/or background to the OHL and by routeing the OHL at a distance from settlements and roads. In addition, OHL routeing takes into account other environmental and technical considerations and will avoid, wherever possible, the most sensitive and valued natural and man-made features.

3.2 Established Practice for Overhead Line Routeing

In 1959, Lord Holford, then advisor to the Central Electricity Generating Board (CEGB), developed a series of guidelines with regard to the routeing of high voltage OHLs which have subsequently become known as the "Holford Rules" ('the Rules'). It is generally accepted across the industry that the Rules should continue to inform the routeing of high voltage OHLs. The Rules were reviewed in the early 1990s by the National Grid Company (NGC) Plc. (now National Grid Electricity Transmission (NGET)) with notes of clarification

[2] RIIO-T2 is the current price control and runs from April 2021 to March 2026. RIIO stands for 'Revenue = Incentives + Innovation + Outputs'. It's a framework used by Ofgem to ensure that network companies, like SPEN, provide a safe and reliable service, value for money, maximise performance, operate efficiently, innovate and ensure the resilience of their networks for current and future customers.

[3] https://www.spenergynetworks.co.uk/userfiles/file/SPEN_Approach_to_Routeing_Document_2nd_version.pdf

added to update them and reflect up to date circumstances. A subsequent review of the Rules including the NGC clarification notes was undertaken by Scottish Hydro Electric Transmission Limited (SHETL) (now SHE Transmission plc) in 2003 to reflect Scottish circumstances. A copy of the Rules as well including notes added through subsequent reviews by NGC, SHETL and most recently by SPEN is contained in Appendix A.

The basic premise of SPEN's general approach draws on the Rules including avoidance of areas of highest or high amenity value where possible as well as consideration of landform, topography and vegetation in order to reduce landscape and visual effects.

3.3 Routeing Considerations

Overview

In line with SPT's statutory duties and licence obligations and drawing upon established practice, routeing considerations comprise environmental, technical and economic factors. The routeing considerations inform the identification and assessment of route options ensuring that it is robust and transparent.

- Environmental factors: route options must take account of their potential environmental impact. Following SPT's statutory obligations this is interpreted as seeking to preserve features of natural and cultural heritage interest and to mitigate as far as possible any effects route options may have on such features as well as more widely taking account of potential impact of route options on the environment and people including on:
    - Landscape including landscape designations and landscape character;
    - Visual amenity;
    - Biodiversity including ecology and ornithology;
    - Cultural heritage including archaeology;
    - Forestry and woodland including ancient and native woodland;
    - Water resources and ground conditions; and
    - Land use, tourism and recreation.
- Technical factors: route options must be technically feasible. This is interpreted by SPEN as it must be possible to build, operate and maintain route options. Technical considerations include matters which would affect these aspects for example existing electricity transmission or distribution infrastructure, topography, side slope gradients, altitude, ground conditions and accessibility.
- Economic factors: route options must be economically viable. This is interpreted by SPEN as meaning that as far as is reasonably practicable, and all other routeing considerations being equal, route options should be as direct as possible and should avoid areas where technical constraints would render route options unviable on economic grounds.

Application of the Holford Rules

Routeing considerations take account of the guidance contained in the Holford Rules and relevant notes or clarifications. In identifying routeing considerations which are relevant to the Grid Connection and Study Area (defined in section 4) the Rules and relevant notes or clarifications have been interpreted and applied to the routeing study.

The Rules are broadly hierarchical with Rules 1 and 2 placing considerable emphasis on avoiding areas of the highest or high amenity value. Rule 1 advises that routes should avoid major areas of the highest amenity value where possible and Rule 2 that routes should avoid smaller areas of high amenity value by deviation. The term "amenity" has generally been interpreted as designated areas or sites of scenic, landscape, nature conservation, scientific, architectural or historical interest. This is consistent with SPT's duties under Schedule 9 to the Electricity Act 1989. For the purposes of this routeing study, the term 'amenity' has been replaced by 'environmental' to more appropriately reflect the intrinsic environmental, social and cultural value of such designated areas.

The review undertaken by SHETL in 2003 provides examples of areas "highest" or "high" amenity or environmental value and states that such areas "require to be established on a project-by-project basis considering Schedule 9 of the Electricity Act 1989". For the purpose of this study, such areas are considered to include international and national designations such as sites designated for landscape, nature, built heritage or archaeological conservation reasons.

The Rules do not identify what constitutes "major areas" or "smaller areas" but indicate that consideration should also be given to the spatial extent of areas of highest or high amenity or environmental value. Value is not considered to be related to the size of an area, so for the purposes of this study this has been interpreted as the extent to which areas of the highest or high amenity or environmental value are avoidable in routeing.

The notes and clarifications provide guidance with regard to areas of moderate or low amenity or environmental value noting that regional or local areas or sites should be identified from development plans. For the purposes of this study, such areas are considered to comprise detailed routeing considerations and include local wildlife sites or reserves, undesignated woodland and outdoor recreational areas such as country parks.

While the Rules do not address residential areas, the subsequent notes and clarifications provide guidance stating "avoid routeing close to residential areas as far as possible on grounds of general amenity". For the purposes of this study, settlements have been defined as areas of the highest amenity or environmental value. Smaller clusters or individual properties are considered to be a deviation issue and while of similar importance they are considered to be a detailed routeing consideration that is more appropriately addressed through the identification of a detailed route alignment.

Rules 3, 4, 5 and 6 highlight the importance of considering landscape and visual matters in routeing including giving consideration to landscape character including sensitivity to OHLs, the use of landform and woodland to reduce visual intrusion or prevent skylining and the presence of other OHLs and the potential to create 'wirescapes'. For the

purposes of this study, landscape and visual considerations have informed the identification of route options taking account of considerations described above as far as possible.

Specific technical or economic considerations are not identified in the Rules or notes and clarifications, however, these form part of SPT's statutory duties. For the purposes of this study this includes the directness of route options as well as matters affecting SPEN's ability to build, operate and maintain an OHL within the route options identified, for example taking account of existing electricity transmission or distribution infrastructure, topography, side slope gradients, altitude, ground conditions and accessibility.

3.4 Approach to Routeing the Grid Connection

Overview

The approach to identifying and assessing alternative route options for the Grid Connection is illustrated below in Figure 3. It follows SPEN's approach and draws upon established practice ensuring that it is robust and transparent. It is a systematic and iterative approach in which an increasing level of detail is applied at each step concluding with the identification of a preferred route option to be subject to consultation. The outcome of each step is subject to a technical review and, where relevant, consultation, 'check' with key stakeholders. Professional judgement is used to establish a balance between technical, economic viability and environmental factors.

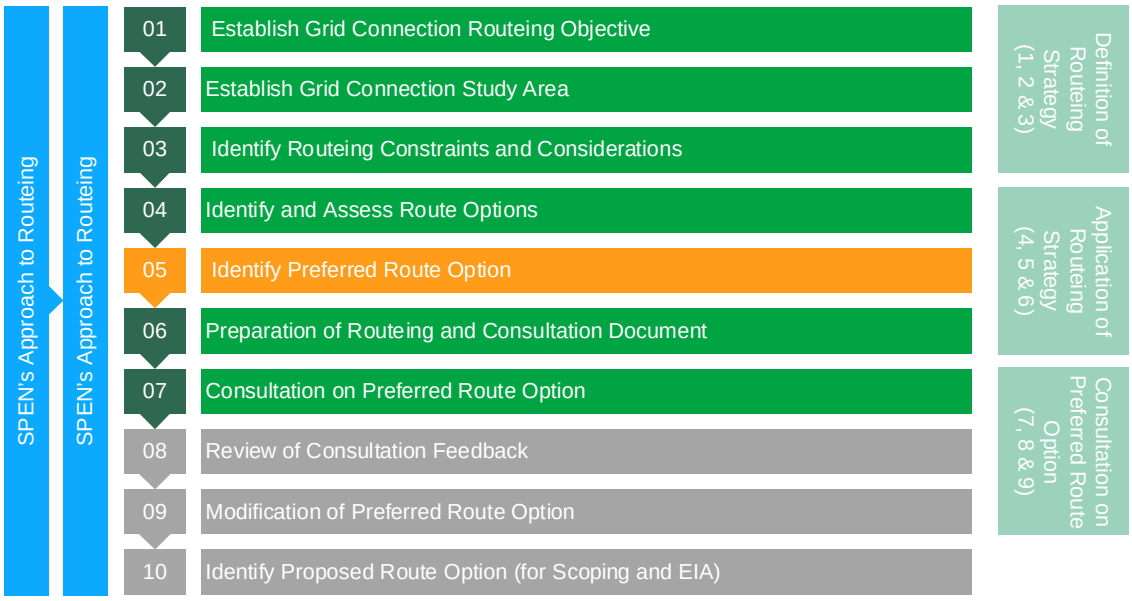


Figure 3 Approach to developing the Grid Connection

There are broadly three key activities:

- Firstly informed by **Steps 1 to 3**, the definition of a routeing strategy specific to the Grid Connection based on a study area and key routeing considerations within it.
- Secondly in **Steps 4 to 6**, the application of the routeing strategy to identify and assess route options concluding with identification of a preferred route option.
- Finally, consultation on the preferred route option through **Steps 7 to 9** with feedback received used to modify the preferred route option where appropriate.

Steps 4 to 7 ensure that route options are identified, assessed and refined taking into account the routeing strategy as well as, where relevant, feedback received from consultation with key statutory stakeholders. For the purposes of the routeing study, route options are identified which form relatively narrow corridors in which an OHL route alignment could be developed in subsequent stages.

Grid Connection Routeing Objective

The first step in the approach has been to identify a routeing objective which takes account of SPT's statutory duties and licence obligations. In accordance with SPEN's overall approach to routeing, the routeing objective for the Grid Connection is "*To identify a technically feasible and economically viable 132 kV overhead line route between Dun Law Wind Farm and the new 132kV Galashiels to Eccles OHL route north of Langlee, Galashiels via the proposed Gala North Substation which causes, on balance, least disturbance to the environment of the Study Area and the people who live, work and enjoy recreation within it.*"

04.
The Study Area

4. The Study Area

4.1 Overview

This section describes the identification of the Study Area and routeing considerations within it as set out in Steps 2 and 3 of the routeing methodology illustrated in Figure 3. This takes into account established approaches to OHL routeing described in the previous section including SPEN's approach to routeing as well as the guidance contained in the Holford Rules. This section should be read with reference to Figure 4 at the end of this section and thematic constraints plans in Appendix B which illustrate key routeing constraints and considerations which have informed the development of the Grid Connection. Full details of key routeing considerations within or immediately adjacent to the Study Area and how they relate to the Rules and subsequent notes are contained in Appendix C.

4.2 Description of the Study Area

Overview

The extents of the Study Area, illustrated in Figure 4 at the end of this section, have been informed by consideration of desk and field-based analysis and an understanding of the need to balance potential adverse environmental effects with technical feasibility and economic viability. Given the locations of DLWF (the 'start' point) and the tee-in point on the new Galashiels to Eccles 132kV OHL route north of Langlee, Galashiels (the 'end' point), the Study Area is relatively narrow and largely orientated north-south. This enables the development of route options between the start and end points while also taking account of areas of the highest environmental value consistent with the Holford Rules and SPEN's approach to routeing as well as the overall length of route options.

The Study Area lies entirely within the administrative area of Scottish Borders Council (SBC). It is bounded to the east by the A68 and to the west by the A7, both of which are largely routed north to south.

Routeing to the east of the A68 would require route options crossing part of the Lammermuir Hills. This would increase the overall length of route options and would require potential routes through or in close proximity to areas or sites of environmental value including routes:

- Crossing the Lammermuir Hills Special Landscape Area (SLA),
- Crossing of watercourses which are part of the River Tweed Special Area of Conservation (SAC),
- In proximity to a number of scheduled monuments with the potential for setting effects,
- In proximity of Thirlestane Castle Garden and Designed Landscape (GDL), and

- In proximity of a number of proposed wind farms including Dichter Law and Longcroft.

Routeing to the west of the A7 would similarly increase the overall length of route options and would require route options crossing the lower slopes of the Moorfoot Hills. This would increase the overall length of route options and would require potential routes through or in close proximity to areas or sites of environmental value including routes:

- In proximity to and crossing watercourses which are part of the River Tweed SAC,
- In proximity to a number of scheduled monuments with the potential for setting effects,
- In proximity to the Moorfoot Hills SAC and Site of Special Scientific Interest (SSSI), and
- In proximity to Longpark Wind Farm.

As a result of excluding areas to the east and west of the A68 and A7 respectively, a relatively narrow Study Area illustrated in Figure 4 has formed the basis for identifying route options. The following sections identify key routeing considerations within or where relevant immediately adjacent to the Study Area.

Areas or Sites of the Highest or High Environmental Value

The following section describes areas of the highest or high environmental value within or close to the Study Area following the guidance in Holford Rules 1 and 2. As described in chapter 3 while the Holford Rules do not define such areas, the subsequent notes advise that they should be considered on a project by project basis. With regard to the DLWF Grid Connection such areas are considered to include international and national designations such as sites designated for landscape, nature, built heritage or archaeological conservation reasons.

Landscape Designations
The Eildon and Leaderfoot National Scenic Area (NSA) lies to the south/south east of the Study Area approximately 1.75m from where the Grid Connection will terminate at the existing 132kV OHL to the north of Langlee, Galashiels. Given the distance of the NSA from where the Grid Connection is required to connect, route options should not require to cross or be in the immediate proximity of the NSA.

Ecological Designations
There are two SACs located within the Study Area. Threepwood Moss SAC (which coincides with Threepwood Moss SSSI) is located approximately 500-600m south of the proposed Gala North Substation and the River Tweed SAC which encompasses the entire river system and as such crosses the study area at various points. Route options should be developed to avoid Threepwood Moss SAC and SSSI in order to prevent impacting on it, however, route options may not be able to avoid crossing tributaries which form part of the River Tweed SAC. Assuming route options crossing the River Tweed SAC are by OHL, impacts should be avoided. Should an option crossing the River Tweed SAC be selected then careful consideration should be given to tower locations in developing a detailed alignment in order to maximise separation distances.

There are no Special Protection Areas (SPAs) within the Study Area. The nearest site is Fala Moor SPA and SSSI approximately 3km north west of the start point at DLWF outside of the Study Area. Given its distance and intervening development including DLWF it is considered unlikely that route options would impact the SPA and its qualifying features.

There are four SSSIs within the Study Area (listed from north to south) comprising Airhouse Wood; Threepwood Moss; Colmsliehill Junipers; Avenil Hill and Gorge. The sites are all designated for the habitats that they support:

- Airhouse Wood – Upland oak woodland
- Threepwood Moss – Raised bog
- Colmsliehill Junipers – Juniper scrub
- Avenil Hill and Gorge – Upland oak woodland and Green hairstreak *Callophrys rubi*

Route options should avoid crossing the SSSIs in order to prevent direct impacts on them, in particular habitat loss. Careful consideration should be given to route options in the immediate vicinity of SSSIs considering potential pathways for impacts such as pollution.

Archaeological and Heritage Designations
There are a number of scheduled monuments present throughout the Study Area including:

- Dere Street, Roman road, Soutra Aisle to Turf Law (SM2962)
- Over Hartside, enclosure (SM4555)
- Kirktonhill, fort (SM4628)
- Hartside scooped homesteads (SM4554)
- Overhowden,henge (SM2155)
- Oxton, Roman camps (SM4378)
- Oxton, Roman fortlet and annexes 230m NNE of Braefoot Cottage (SM2837)
- Bowerhouse,fort 480m NW of (SM365)
- Blackchester,fort (SM364)
- Trabrown, settlement 600m SW of (SM4629)
- Langshaw Tower and associated structures (SM6829)
- Colmslie Tower (SM6828)

Route options should avoid scheduled monuments as much as possible, however, the number of monuments present along with their distribution within the Study Area, particularly to the north at Soutra, means that some setting impacts are likely to be unavoidable. Regard should be had to the setting of scheduled monuments in developing

route options, for example making use of landform and vegetation to reduce impacts as much as possible.

There are a number of listed buildings located within the Study Area. These are largely concentrated at Lauder coinciding with a Conservation Area, however, individual listed buildings are also present in open, rural areas.

Other Designations
Ancient woodland, which is designated as irreplaceable habitat in National Planning Framework (NPF4) is present in small areas throughout the Study Area. Named sites (listed from north to south) include Airhouse Wood, Colmsliehill Birks and Rough Heugh, however, unnamed sites are also present. The sites are also identified in the Native Woodland Survey of Scotland (NWSS). Route options should avoid Ancient Woodland sites as well as woodlands identified in the NWSS in order to prevent the loss of woodlands.

Settlement
As described in section 3 the Holford Rules do not identify settlements, however, for the purposes of this study they are treated as areas of high environmental value to be avoided as much as possible. The rural nature of the Study Area means that the principal settlement considerations are Oxton, Lauder, Stow and Galashiels. There are a number of scattered clusters of residential properties or individual residential properties throughout the Study Area. These should be avoided as much as possible, however, subject to route selection these may be more effectively addressed when developing a route alignment.

Areas or Sites of Moderate or Low Environmental Value

For the purposes of this study, areas of moderate or low environmental value comprise sites designated at a local or regional level including local wildlife sites or Special Landscape Areas (SLAs), undesignated woodland and recreational areas such as walking or cycling routes or more formalised recreational resources such as golf courses.

Landscape Designations
There are no SLAs within the Study Area as it has been developed taking account of the Lammermuir Hills to the north/north east of the Study Area and the Tweed, Ettrick and Yarrow Confluences SLA to the south/south west of the Study Area. Route options can be developed between DLWF and the new Galashiels to Eccles 132kV OHL that avoid the SLAs.

Ecological Designations
Local Biodiversity Sites (LBS) have been identified from Technical Note 4 which forms part of the proposed Local Development Plan (LDP). There are six LBS within or close to the Study Area including:

- Site 11: Ellwynd Wood and Meadow to the south of the Study Area south of where the Grid Connection will connect to the new Galashiels to Eccles 132kV OHL.
- Site 29: Lauder Burn - Herriot Side to Threepwood Bridge within the centre of the Study Area to the north of the proposed Gala North Substation.

- Site 30: Lauder Burn - Lauder to Herriot Side within the centre of the Study Area to the west of Lauder.
- Site 31: Lauder Common occupying 364ha within the centre of the Study Area west of Lauder extending to the north and south of the B6362.
- Site 40: Raughy Burn located within the north of the Study Area immediately south of DLWF.
- Site 49: Threeburnford Cleugh within the north of the Study Area approximately 2.7km west of Oxton.

Recreational Resources
There are two notable recreational features within the Study Area:

- The Southern Upland Way – a long distance walking route which is located to the east of the Study Area is routed broadly north to south from Lauder to Melrose. Route options should be developed taking account of the walking route and reduce impacts on the amenity of users of the Southern Upland Way as much as possible.
- Lauder Golf Club – a nine-hole golf course located to the west of Lauder approximately 2.5km north/north east of the proposed Gala North Substation. Route options should be developed to avoid directly routeing across the golf course.

Landscape Character

As noted above there are two local level landscape designations located to the northern and southern margins of the Study Area. Towards the north is the Lammermuir Hills SLA which is the largest expanse of moorland within the Borders. This SLA is characterised by the moorland and valleys with a string of wild qualities despite its more managed nature. The extent and uninterrupted openness contribute to the wider scenic quality. Although the area is very sparsely settled, the wider Lammermuir plateau forms an important part of the setting of settlements. The Tweed, Ettrick and Yarrow Confluences SLA is located to the south/south west of the Study Area and adjacent to the Eildon and Leader Foot NSA.

Landscape character within the rest of the Study Area is defined largely by plateau grassland and undulating upland valley and fringes but also a mix of farmland. Several large-scale wind farms are notable features within the plateau grassland landscapes which occupy the northern part of the Study Area. The following Landscape Character Types (LCT) as defined by the digital map-based national Landscape Character Assessment published by NatureScot (2019) are found within the Study Area.

- LCT 131 Plateau Grassland – Borders;
- LCT 15 Upland Valley with Mixed Farmland;
- LCT 107 Undulating Upland Fringe; and
- LT 35 Settled Upland Fringe Valley.

The broad upland valley and mixed farmland covers the valley floor and occupies much of the north-eastern side of the Study Area. This landscape is defined by the evenly sloping valley sides and the arable pasture with pockets of woodland, hedgerows and trees. The windfarms and electrical overheard lines are notable infrastructure that define the western boundary of the upland valley landscape. The Plateau Grassland – Borders LCT occupies much of the northwestern half of the Study Area and is characterised by the large-scale rolling topography, large expanses of gentle slopes and grassland with patches of heather which contribute to the sense of remoteness and isolation.

The central part of the Study Area is dominated by the transition from the plateau to the undulating larger scale upland fringe landscapes to the west and south of Lauder. The southern part of the Study Area is characterised by the Undulating Upland Fringe LCT and is a transitionary landscape between the valley landscapes to the east and the upland plateau to the northwest. This largescale landscape is characterised by undulating landform, improved pasture and small villages connected by the local road network.

A network of roads and transport routes are present within the Study Area, including the A68 along the eastern edge. The B6362 bisects the central part of the Study Area whilst a series of local roads connect to the main road through Langshaw heading south to Galashiels at the southern edge of the Study Area. More broadly west-east routes connect the A7 to the A68. These principal routes are interconnected by a range of local and minor roads and numerous core paths though farmland. The Southern Upland Way is a long-distance route running through the eastern part of the Study Area on higher ground from Lauder to Galashiels offering long range sequential views.

Scattered properties and farmsteads and occasional settlements are located throughout the landscape. Larger settlements of note are limited to Lauder and Galashiels at the eastern and southern periphery of the Study Area.

Existing electrical infrastructure consists of a network of OHL, including a 400 kV line and a 132kV line running from north to south in the central part of the Study Area. A network of smaller 11kV wood pole lines traverse throughout the Study Area. Large-scale wind farms are concentrated in the northern part of the Study Area whilst smaller scattered wind turbines are also present throughout.

Other Routeing Considerations

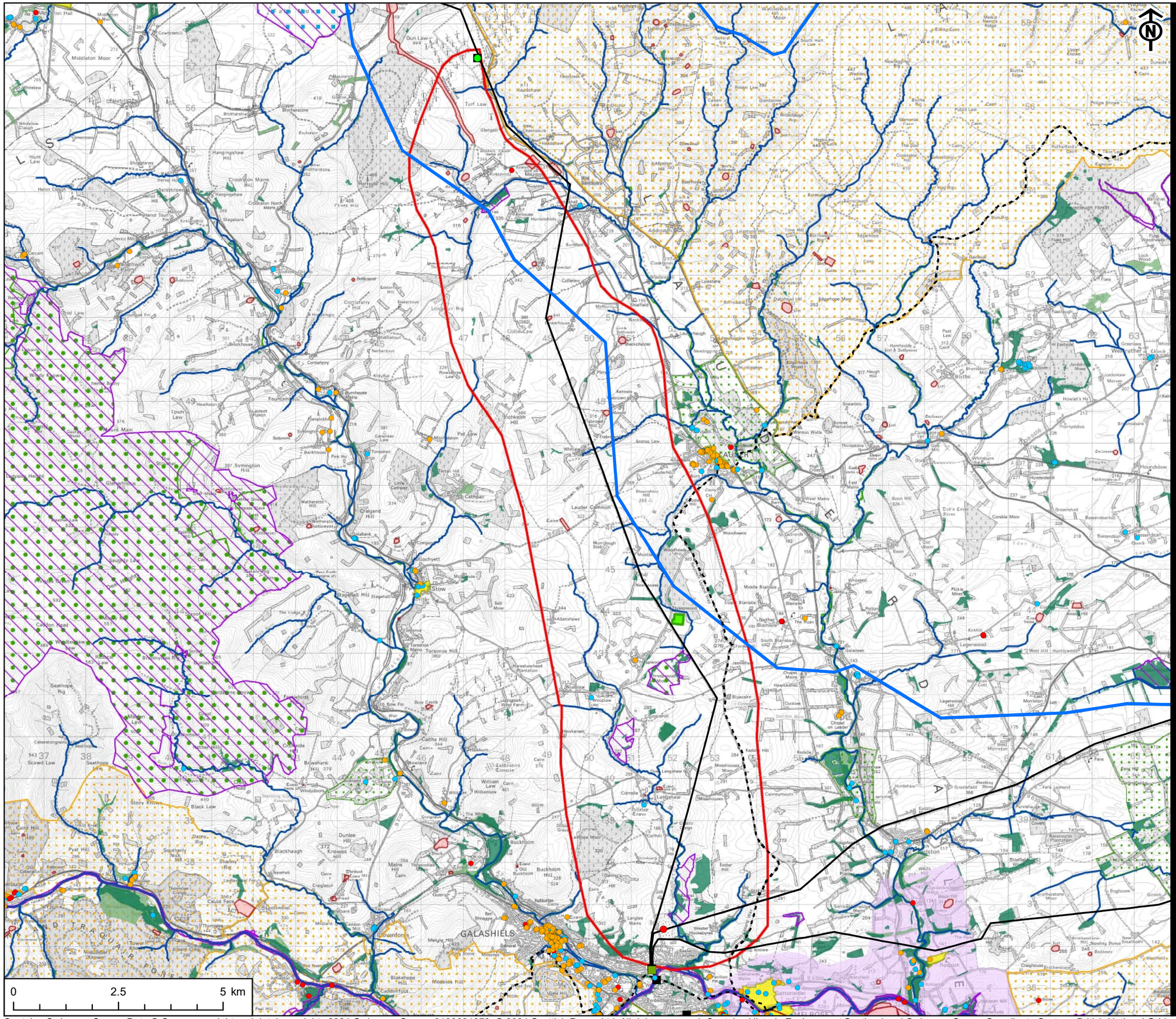
Existing Electricity Transmission Infrastructure
There are a number of existing OHLs within the Study Area which could constrain or influence the development of route options:

- P Route: This is an existing 132kV OHL from Smeaton to Dun Law to Galashiels. While the existing OHL will be dismantled this cannot occur until the new Grid Connection has been constructed and energised meaning route options will need to be developed taking account of it.
- ZA Route: This is an existing 400kV OHL from Smeaton Substation to Eccles Substation. The OHL will also be connected to the proposed Gala North Substation

which constrains routeing options for the Grid Connection and how it connects to the proposed Substation.

- U and AT Routes: These are existing 132kV OHLs from Galashiels to Eccles which are due to be replaced by a new Galashiels to Eccles 132kV OHL. The Grid Connection will 'tee-in' to the new OHL from where it will be routed to Galashiels Substation by existing underground cables.

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Study Area
- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point
- Category A Listed Buidling
- Category B Listed Building
- Category C Listed Building
- Southern Upland Way
- Watercourse
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Garden and Designed Landscape
- National Scenic Area
- Special Landscape Area
- Ancient Woodland
- Native Woodland
- Scheduled Monument
- Conservation Area

SPT Transmission Substation
- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network
- Existing 132kV
- Existing 400kV

TITLE
Figure 4
Grid Connection Study Area and Key Routeing Considerations

REFERENCE
DL_20240611_RR_4_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

05.

Routeing Strategy and Assessment of Route Options

5. Routeing Strategy and Assessment of Route Options

5.1 The Routeing Strategy

The Routeing Strategy has been developed taking into account the routeing objective identified in Section 3 and the routeing considerations identified in Section 4. The purpose of the Routeing Strategy is to ensure a consistent approach to identifying and assessing route options leading to the identification of a preferred route option which best meets the objective while balancing the routeing considerations. The routeing strategy developed for the Grid Connection is as follows:

"*Route options for a continuous overhead line route will avoid areas of the highest or high environmental value and settlement where possible while responding to and making best use of landscape character and features including topography and woodland to screen or backcloth routes. Where conflicting environmental and technical considerations are identified, these will be carefully balanced when assessing route options.*"

5.2 Identification of Route Options

Overview

Figure 5 at the end of this section provides an overview of the route options identified for the Grid Connection. For the purpose of assessing the route options they were divided into three sections north to south as described in the table below. A combination of route options within each section would establish a continuous OHL route between DLWF, the proposed Gala North Substation and the connection to the new Galashiels to Eccles 132kV OHL. The following sections provide a brief description of each of the Route Options identified.

Table 2 Identification of Route Options

Section	Description	Route Options
Section 1	DLWF to west of Lauder	1A or 1B (sub-options 1B-1 or 1B-2)
Section 2	West of Lauder to Gala North	2A or 2B or 2C
Section 3	Gala North to new 132kV OHL	3A or 3B

Section 1. DLWF to west of Lauder

Within this northern section two route options were identified from DLWF to Lauder Common, west of Lauder: a western option referred to as route option 1A and an eastern option referred to as route option 1B. As part of route option 1B, two sub-options were identified 1B-1 and 1B-2. These are illustrated in Figure 6.

Route Option 1A – Route Description

Route Option 1A runs contiguous to the western extent of Route Option 1A as it heads south/south west from DLWF Substation. It crosses the western facing slopes of Turf Law. Subject to the development of a detailed route alignment Route Option 1A could require crossing a scheduled monument (Dere Street Roman road, Soutra Aisle to Turf). There is some scope to avoid the scheduled monument but this would require routeing in close proximity to it and across the top of Turf Law increasing the potential for an OHL to break the skyline. From here the Route Option follows a narrow valley and the course of the Raughy Burn passing Kirkton Hill towards Hartside Farm. This section of the Route Option would require routeing to the east or west of a scheduled monument (Kirkton Hill fort) as well as crossing the existing 400kV OHL (ZA route). There are a small number of unnamed watercourses as well as Mountmill Burn in this location that would require to be crossed. Around Hartside Farm the Route Option changes direction from south west to south/south east. The Route Option follows the landform routeing along hillslopes including Collie Law, Inchkeith Hill and Old Whitlaw until reaches the B6382.

Route Option 1B – Route Description

Route Option 1B is routed on the lower eastern facing slopes of Turf Law heading southwards from the DLWF Substation. It largely follows the landform seeking to utilise the upper hillslopes to backcloth views of the OHL and prevent or reduce skylining. The Route Option crosses a valley landform over which it crosses a minor road which provides local access to rural properties and farms as well as Mountmill Burn which is draining in an eastern direction. The Route Option continues in a southerly/south easternly direction largely following the landform as much as possible. This section of Route Option 1B is west of the existing 132kV OHL (P route) and therefore set further back from the A68. As the Route Option passes to the west/south west of Oxton, the Route Option crosses the existing 132kV OHL north of Overhowden Farm. The Route Option continues in a southern direction along lower lying hillslopes around Blackchester and Trabrown Hill while avoiding scattered rural properties until it reaches the B6362 west of Lauder.

Route Sub-Option 1B-1 – Route Description

Sub-option 1B-1 provides link between Route Options 1A and 1B. It deviates from Route Option 1A at Herriotshiels west of Oxton in a southern direction towards the lower hillslopes of Collie Law. From there it runs contiguous to Route Option 1B across the east facing slopes of Collie Law and Inchkeith Hill before ending at Old Whitlaw. There are a small number of constraints present within the northern part of the sub-option including farms and a scheduled monument.

Route Sub-Option 1B-2 – Route Description

Sub-option 1B-2 provides an alternative option running in a southern direction between Route Option 1A and Route Option 1B. It follows the existing 132kV OHL (P route) from west of Collielaw House towards the B6382. It crosses the lower east facing hillslopes of Collie Law, Inchkeith Hill and Trabrown Hill. There a small number of constraints within the Route Option including a scheduled monument and farm properties.

Section 2. West of Lauder to Gala North

Within this section three route options were identified from west of Lauder at Lauder Common to the proposed Gala North Substation: a western route option referred to as route option 2A, a central route option referred to route option 2B and an eastern route option referred to as route option 2C. These are illustrated in Figure 7. As noted in section 2 of this RCD the connection to Gala North Substation will require a sealing end compound and installation of underground cables from the sealing end to the substation. This has been taken into account in identifying the route options, however, the precise detail including the location of sealing end towers and length of underground cabling has not been determined at this stage.

Route Option 2A – Route Description
From the B6282 Route Option 2A crosses Staunchley Hill to the west of Lauder. It crosses a valley formed by Staunchley Hill, Woodheads Hill and Chester Hill. In this area the Route Option would cross the Lauder Burn. It broadly parallels the existing 400kV OHL (ZA route) routeing through existing commercial forestry which lies to the north of the proposed Gala North Substation and enables a connection to the substation from the north or east. The existing 400kV OHL (ZA route) will be turned into the proposed substation which provides opportunities for Route Option 2A to avoid crossing the existing 400kV OHL.

Route Option 2B – Route Description
Route Option 2B is routed to the west of Staunchley Hill in between the existing 400kV OHL route (ZA route) to the east and the exiting 132V OHL route (P route) to the west. It is routed in a south/southern eastern direction to the proposed Gala North Substation and is routed through the forestry which lies to the north. It enables a connection to the substation from the north only.

Route Option 2C – Route Description
Route Option 2C is the most western of the options identified in this section. It is routed from the B6382 across Lauder Common following the lower slopes of Muircleugh Hill. The Route Option turns in an eastern direction requiring a crossing of the existing 132V OHL route (P route) in order to connect to the proposed substation from either the north or west of it.

Section 3. Gala North to new 132kV OHL

Within this section two route options were identified from the proposed Gala North Substation to a tee-in point on the new Galashiels to Eccles 132kV OHL: a western route option referred to as route option 3A and an eastern route option referred to as route option 3B. These are illustrated in Figure 8.

Route Option 3A – Route Description
Route Option 3A starts to the west/south west of Gala North Substation and largely follows the B6374 (Lauder-Galashiels). The Route Option largely follows the landform with hillslopes rising up to the east and west of the road. Landform narrows to form a valley between Threepwood and Langshaw with the Route Option following this and

providing opportunities to use hillslopes to backcloth the route and reduce skylining. At Colmsliehill the Route Option widens in order to provide opportunities to avoid Colmsliehill Junipers SSSI by routeing to the west or east of it. South of Langshaw the Route Option traverses the east facing slopes of Picts Hill and Darling's Hill until it crosses the existing 132kV OHL (P route) north of Langlee, Galashiels and ends where it would connect to the new Galashiels to Eccles 132kV OHL.

Route Option 3B – Route Description

Route Option 3B starts to the east/south east of Gala North Substation and partly follows the existing 132kV OHL (P route) in a southern direction. It is routed to the east of Threepwood Moss SAC and SSSI following landform as much as possible across Kedslie Hill and Easter Hill before reaching the end point where it would connect to the new Galashiels to Eccles 132kV OHL.

5.3 Assessment of Route Options

Overview

This section presents the assessment findings of each section and route options therein in relation to the routeing considerations described in Section 4 and Appendix C.

Section 1. DLWF to west of Lauder

Table 3 sets out the findings of the appraisal of Route Options 1A and 1B as well as Sub-Options 1B-1 and 1B-2. The table should be read in conjunction with Figure 6 which illustrates key routeing considerations within Section 1 and Figure 9 which illustrates landscape character.

Table 3 Assessment of Route Options: Section 1 DLWF to west of Lauder

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
Landscape Character	This route option is almost entirely located within the Plateau Grassland - Borders LCT. Landscape character is influenced by a mix of agricultural fields, open grasslands across the outer and easternmost slopes of this LCT. The northern part of this route option includes meandering burns on lower slopes and the edges of very small pockets of plantation woodland. The central part of the route is defined by a network of	This route option is mostly contained within the Upland Valley with Mixed Farmland LCT. The northern extent is located within the Plateau Grassland - Borders LCT. However, the character and impression of the upland valley prevails through this route option. The land within this route option includes open moorland towards the north and a concentration of medium to large scale agricultural fields with	This route option is located mostly within Plateau Grassland - Borders LCT and partially within the Upland Valley with Mixed Farmland LCT to the north. Landform is undulating across a line of low hills sloping west to east. The landscape is comprised of a patchwork of medium scale agricultural fields, several of which are defined by tree lined boundaries towards the north. Towards the south there are few landscape elements of note.	This route option is located partially within the Upland Valley with Mixed Farmland LCT towards the north and south. The central part of the route option is contained within the Plateau Grassland - Borders LCT. The Landscape is defined by a patchwork of irregular agricultural fields where field boundaries are uncommon. There is one block of plantation woodland and one tree lined field towards the north. Landform is sloping from west to east

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
	sloping agricultural fields following an incised valley. Towards the south the route smaller fragmented blocks of plantation are present along with more undulating pasture and several burns. There are opportunities within this route option to make use of the lower slopes and more upland backclothing of the proposed OHL.	defined hedgerow or tree lined field boundaries and linear belts of trees. This route option crosses several local roads that run east-west, perpendicular to the route. This route also crosses several watercourses through more undulating topography towards the south. Sloping topography to the east provides opportunities to reduce the prominence of the proposed OHL within the landscape.		with occasional knolls that run in a line from south to north. The lower slopes relative to the surrounding undulating and upland landform within the Study Area offer opportunities to minimise the influence of a proposed OHL within the landscape.
Visual Amenity	Settlement and residential properties within this route option are limited to one farmstead. A short section of one Core Path crosses the middle section of the route option. The local road network is limited to access routes to other farmsteads. Careful routing of an OHL could utilise existing	The residential properties within this route option are limited to one farmstead towards the southern part of this route option. Some farmsteads are located immediately east of this route option. A short section of one Core Path between Lauder and a farmstead bisects this route	At the northern extents of this route option a cluster of buildings associated with one farmstead is enclosed by woodland and tree lined boundaries. One other farm related building is located within this route option. One very small section of Core Path crosses part of the route option and follows a	Residential properties within this route option are limited to one farmstead, towards the south. Two other farmsteads are located immediately to the east of this route option at lower levels. One Core Path bisects this route option towards the south.

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
	landform which would form the western backcloth to minimise visual effects from more distant visual receptors to the east.	option towards the south. Another Core Path on higher ground to the east would overlook the southern half of this route option. This route option also bisects several local roads leading to farms and cottages. The lower slopes of the valley provide an opportunity to reduce the visual prominence from more distant and long range views obtained from visual receptors to the west and east.	block of boundary woodland near the farm cottages in the north. The higher landform through which this route option is located is likely to increase the visual prominence of a proposed OHL from other settlement and recreational routes to the east.	Localised and exposed knolls towards the south within this route option would increase the likelihood of visual effects of the proposed OHL from residential properties and recreational routes to the east. However, the existing 132kV line that defines the western boundary of this route option provides an existing context of OHL features within the view. The consolidation of OHL routes within the same part of views could reduce wider visual effects.
Ecology and Biodiversity	This route option avoids statutory ecological designations of the highest or high environmental value. Airhouse Wood SSSI lies to the east of the route option east of Hartside Farm and is sufficiently far enough away that it should not be affected.	This route option does not route through or close to statutory ecological designations either of the highest or high environmental value. The route option also avoids local sites of moderate or low environmental value but is	This route sub-option does not route through or close to statutory ecological designations either of the highest or high environmental value. The sub-option also avoids local sites of moderate or low environmental value but is	This route sub-option does not route through or close to statutory ecological designations either of the highest or high environmental value. The sub-option also avoids local sites of moderate or low environmental value but is

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
	Local sites of moderate or low environmental value which are crossed by or near to the route option include Raughy Burn, Threeburnford Cleugh and Lauder Common LBSs. Crossing these sites would result in some permanent impacts on habitats which are present.	adjacent to Lauder Common where it meets section 2.	adjacent to Lauder Common where it meets section 2.	adjacent to Lauder Common where it meets section 2.
Cultural heritage	There are a number historic environment designations of the highest or high environmental value within or near to the route option which could be affected by it. This includes: • Dere Street Roman Road which would likely require to be crossed. • An enclosure on Hartside Hill to the west which could experience setting impacts. • A fort at Kirktonhill within the route option which could deviated around	This route option is routed to the west of two scheduled monuments north of Oxton; a Roman camp and fortlet. While these are outside of the option their proximity is such that some setting impacts would be likely. Further south, the route option encompasses Blackchester Fort, a scheduled monument. The route option provides scope to deviate around it, however, setting impacts would be likely to occur.	There is a scheduled monument, Overhowden henge, located within the sub-option to the west of Overhowden Farm. The route option provides opportunities to avoid the scheduled monument, however, the route would be in close proximity to it and would likely result in setting impacts.	Bowerhouse fort, a scheduled monument, is located on the eastern slopes of Collielaw and is within the route option. The existing 132kV OHL (P route) and 400kV OHL (ZA route) are located in close proximity to the fort. A new OHL in this location would likely result in setting impacts. Further south the sub-option is routed across Trabrown Hill to the west of a scheduled monument (Trabrown settlement). While it is outside of the route option

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
	but would experience setting impacts. • Scooped Homesteads within the route option which could be deviated around but would experience setting impacts. • Cathpair hut circles and field system approximately 700m to the west of the option which may experience setting impacts.	Further south where the route option crosses the lower slopes of Trabrown Hill, a scheduled monument (Trabrown settlement) lies upslope of it. While it is outside of the route option there is potential for setting impacts.		there is potential for setting impacts.
Forestry and woodland	The majority of the woodland present within the route option comprises small shelter belts or small blocks of plantation woodland. Most of the woodland is undesignated woodland or forestry (i.e. it is not a site identified on the Ancient Woodland Inventory nor is it identified in Native Woodland of Scotland Survey (NWSS)) with the exception of a small block of wet woodland on Old	None of the woodland or forestry present within the route option is identified on the Ancient Woodland Inventory or in the NWSS. Woodland is present in localised areas comprising small shelter belts or plantation woodland. The route option provides opportunities to avoid directly impacting woodland.	A small block of wet woodland identified on the NWSS is present within the route option to the south of Collie Law. None of the woodland or forestry present within the route option is identified on the Ancient Woodland Inventory. Small areas of woodland are present within the route option including shelter belts which extend across the option meaning some	None of the woodland or forestry present within the route option is identified on the Ancient Woodland Inventory, however, there are small woodland blocks identified on the NWSS as lowland mixed deciduous woodland. The distribution of these blooks and other undesignated woodland within the route option create localised pinch points where

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
	Whitlaw. Woodland cover is generally limited within the route option, however, there are localised pinch points where some woodland removal is unavoidable.		woodland removal is likely to be unavoidable.	some woodland is likely to be unavoidable.
Water resources	There are a small number of surface watercourses present within the route option typically draining in an eastern direction towards the Leader Water. Water resources are not considered to present a significant constraint as they could be spanned by an OHL.	There are a small number of surface watercourses present within the route option typically draining in an eastern direction towards the Leader Water. Water resources are not considered to present a significant constraint as they could be spanned by an OHL.	There is a single unnamed watercourse present within the route option south of Overhowden Farm. Water resources are not considered to present a significant constraint as they could be spanned by an OHL.	There are a small number of surface watercourses present within the route option typically draining in an eastern direction towards the Leader Water. Water resources are not considered to present a significant constraint as they could be spanned by an OHL.
Ground conditions	Class 3, 4 and 5 peatlands are present in localised areas within the route option. Class 3 and 5 peatlands are present in small areas to the north of this option as it is routed south from DLWF. Class 4 peatlands are present to the south of this option where it starts to cross Lauder Common towards the B6362.	Small, localised areas of class 3 and 5 peatlands are present to the south and north of this option respectively. The class 3 peatlands to the south towards Lauder Common are avoidable, however, the distribution of class 5 peatlands to the north of option means some localised	No areas of peat are present within this sub-option.	A small area of class 3 and 4 peatland is present to the south of this sub-option at Lauder Common. This area is unavoidable so some impacts on peat are likely to occur.

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
	The distribution of class 3 and 5 peatlands in the north of the option means that some impacts would be unavoidable.	impacts would be unavoidable.		
Land use	Agricultural land capability maps indicate that the route option is underlain by land which is classed as 5.1 or 5.2 (i.e. capable of use as improved grassland). This is largely consistent with aerial photography and site observations with the majority of land used for grazing or as grassland with limited crop growing. There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.	Agricultural land capability maps indicate that the route option is underlain by land which ranges from 4.1 to 4.2 and 5.1 to 5.2. Land classed as 4.1 or 4.2 (i.e. capable of producing a narrow range of crops) is located on lower lying towards the east with land classed as 5.1 or 5.2 located on more elevated areas. This is largely consistent with aerial photography and site observations. There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.	Agricultural land capability maps indicate that the route option is underlain by land which is classed as 5.1 or 5.2 i.e. capable of use as improved grassland. There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.	Agricultural land capability maps indicate that the route option is underlain by land which is classed as 5.1 or 5.2 i.e. capable of use as improved grassland. There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.
Tourism and recreation	There are no formal tourism or recreation attractions	There are no formal tourism or recreation attractions	There are no formal tourism or recreation attractions	There are no formal tourism or recreation attractions

Topic	Route Option 1A	Route Option 1B	Route Sub-Option 1B-1	Route Sub-Option 1B-2
	present within the route option. The route option crosses a Core Path to the north of Collie Law.	present within the route option. The route option crosses a Core Path to the north of Scarce Law while another Core Path extends into the option east of Blackchester.	present within the route option. A Core Path extends into the sub-option north of Overhowden.	present within the route option. The route option crosses a Core Path to the south of Trabrown Hill.
Engineering	An engineering review of the route option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of a continuous OHL within the section. The key constraints related to a requirement to cross the existing 400kV OHL (ZA route) as well as high pressure gas pipeline and topography with elevations greater than 200mAOD resulting in increased ice and wind loading.	An engineering review of the route option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of a continuous OHL within the section. The key constraints related to a requirement to cross the existing 132kV OHL (P route) as well as routeing in parallel to and crossing a high-pressure gas pipeline. Topography with elevations greater than 200mAOD resulting in increased ice and wind loading was also identified as a constraint.	An engineering review of the route sub-option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of an OHL between route options 1B and 1A. The key constraints related to a requirement to cross the existing 400kV OHL (ZA route) and topography with elevations greater than 200mAOD resulting in increased ice and wind loading.	An engineering review of the route sub-option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of an OHL between route options 1B and 1A. The key constraints related to a requirement to cross the existing 400kV OHL (ZA route) and routeing in proximity to ZA route and the existing 132kV OHL (P route) as well as topography with elevations greater than 200mAOD resulting in increased ice and wind loading.

Section 2. West of Lauder to Gala North

Table 4 sets out the findings of the appraisal of Route Options 2A, 2B and 2C. The table should be read in conjunction with Figure 7 which illustrates key routeing considerations within Section 2 and Figure 9 which illustrates landscape character.

Table 4 Assessment of Route Options: Section 2 West of Lauder to Gala North

Topic	Route Option 2A	Route Option 2B	Route Option 2C
Landscape Character	This route option is located almost entirely within the Undulating Upland LCT with a peripheral northern section falling within the Plateau Grassland – Borders LCT. The northern section is defined by open coarse grassland and patches of heather moorland. The central and southern part of this route option is comprised of agricultural fields and unbroken linear belts of woodland. Landform is sloping from west to east. Opportunities to minimise landscape effects are limited to the natural sloping landform and the context of the 132kV route to the east.	This route option is located almost entirely within the Undulating Upland Fringe LCT. Land within the route option includes an area of open grassland and heather moor towards the north. The remainder of the route option is defined by agricultural fields and follows the area east of the existing 400kV OHL. One pocket of plantation woodland extends across the route option to the south. The lower-level landform and existing OHL contribute to back clothing and consolidation of OHL corridors could limit landscape effects but would also contribute to a concentrated section of wirescape within the landscape.	This route option is located within the Upland Valley and Mixed Farmland LCT. The landscape is defined by undulating landform and more open agricultural fields towards the north. Landscape features transition from fields to bands of woodland concentrated in the south which are severed by the existing 400kV OHL. Towards the north, two burns bisect this route corridor north of the B6363. Another burn follows the edge of a woodland block in the south.
Visual Amenity	There are no residential properties or recreational routes within this route option. Visual receptors likely to be affected by a proposed OHL route would include more distant routes and	There are no residential properties or recreational routes within this route option. Several farmsteads immediately west would experience filtered views towards this route corridor. The	There are no residential properties or settlement within this route corridor. One Core Path crosses the northern most part of this route corridor along a lower contour. The Southern Upland Way

Topic	Route Option 2A	Route Option 2B	Route Option 2C
	residential properties to the east. More elevated landform to the west would help to minimised visual effects.	Southern Upland Way is located to the east on higher ground where there would be open views west. This route option is contained between existing context of the 400KV line immediately east and the 132kV line to the west. This has the potential to reduce wider fragmentation of views but could intensify the influence of electrical infrastructure.	is located to the east and runs in parallel to the route option on the lower side of an intervening hill. Opportunities to limit visual effects are limited to the lower slopes of the route corridor which would reduce the prominence of the proposed OHL from lower-level visual receptors to the east. Use of existing woodland to partially screen sections of the proposed OHL from views experienced from the Southern Upland Way may be possible for limited sections of the route.
Ecology and Biodiversity	This route option avoids statutory ecological designations of the highest or high environmental value. This route option crosses sites of moderate or low environmental value including Lauder Common LBS and Lauder Burn Herriot Side to Threepwood Bridge LBS and has the potential to impact habitats within them.	This route option avoids statutory ecological designations of the highest or high environmental value. This route option crosses sites of moderate or low environmental value including Lauder Common LBS and Lauder Burn Herriot Side to Threepwood Bridge LBS and has the potential to impact habitats within them.	This route option avoids statutory ecological designations of the highest or high environmental value. This route option crosses sites of moderate or low environmental value including Lauder Common LBS and Lauder Burn Lauder to Herriot Side LBS and has the potential to impact habitats within them.
Cultural heritage	There is one scheduled monument which lies approximately 700m to the west of the route option where it starts at the B6362. Cathpair hut circles and	There are no historic environment designations of the highest or high environmental value within or near to the route option.	There are no historic environment designations of the highest or high environmental value within or near to the route option.

Topic	Route Option 2A	Route Option 2B	Route Option 2C
	field system may experience setting impacts.		
Forestry and woodland	The route option largely avoids trees and woodland with the exception of a shelterbelt to the south as the option turns east to enable connection to the proposed Gala North Substation. Part of the shelterbelt which extends across the option is identified as lowland mixed deciduous woodland on the NWSS. As the treebelt extends across the option some tree removal is unavoidable.	This option is routed through the forestry to the north of the proposed Gala North Substation. The forestry is not identified on the Ancient Woodland Inventory or the NWSS. A wayleave would require to be established through the forestry resulting a loss of trees.	This option is routed through the forestry to the north of the proposed Gala North Substation. The forestry is not identified on the Ancient Woodland Inventory or the NWSS. A wayleave would require to be established through the forestry resulting a loss of trees.
Water resources	The route option crosses a small number of watercourses that drain the hillslopes in an eastern direction towards Lauder Burn. Water resources are not considered to present a significant constraint as they could be spanned by an OHL.	The route option crosses a small number of watercourses that drain the into the Lauder Burn as well as the Lauder Burn itself to the north of the proposed Gala North Substation. Water resources are not considered to present a significant constraint as they could be spanned by an OHL.	The route option crosses a small number of watercourses that drain the into the Lauder Burn as well as the Lauder Burn itself to the north of the proposed Gala North Substation. Water resources are not considered to present a significant constraint as they could be spanned by an OHL.
Ground conditions	Small areas of class 4 peatland are present to the north of this option at Lauder Common. This area is unavoidable so some impacts on peat are likely to occur.	Small areas of class 4 peatland are present to the north of this option at Lauder Common. This area is unavoidable so some impacts on peat are likely to occur.	A small area of class 4 peatland is located to the north of this option at Lauder Common, however, the extent of this area is small and therefore impacts are considered to be avoidable.

Topic	Route Option 2A	Route Option 2B	Route Option 2C
Land use	The route option crosses land for which the land capability for agriculture is classed as 4.1-4.2 or 5.1-5.2 land which is suitable for producing a narrow range of crops or for use as improved grassland. There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.	The route option crosses land for which the land capability for agriculture is classed as 4.1-4.2 or 5.1-5.2 land which is suitable for producing a narrow range of crops or for use as improved grassland. There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.	The route option crosses land for which the land capability for agriculture is classed as 4.1-4.2 land which is suitable for producing a narrow range of crops. There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.
Tourism and recreation	There are no formal tourism or recreation attractions present within or in close proximity to the route option.	There are no formal tourism or recreation attractions present within or in close proximity to the route option.	The Southern Upland Way lies to the east of the route option. There would be no physical impact on the long distance walking route, however, an OHL could impact on the amenity of users of it. Lauder Golf Course lies to the east of the route option but would be unaffected by it.
Engineering	An engineering review of the route option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of a continuous OHL within the section. The key constraints related to a requirement to cross the existing 132kV OHL (P route) in order to connect to the	An engineering review of the route option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of a continuous OHL within the section. The key constraints related to topography with elevations greater than 200mAOD resulting in increased ice and	An engineering review of the route option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of a continuous OHL within the section. The key constraints related to routeing in proximity to the existing 400kV OHL (ZA route) and the requirement to cross it to

Topic	Route Option 2A	Route Option 2B	Route Option 2C
	proposed Gala North Substation. Topography with elevations greater than 200mAOD resulting in increased ice and wind loading was also identified as a constraint. It was noted that the requirement to cross P route could be mitigated by terminating the OHL at sealing end compound and cabling into the proposed Gala North Substation.	wind loading was also identified as a constraint and the requirement to fell forestry to establish a wayleave.	connect to the proposed Gala North Substation as well as topography with elevations greater than 200mAOD resulting in increased ice and wind loading. The requirement to fell forestry to establish a wayleave as was also identified as an engineering consideration. It was noted that the requirement to cross P route could be mitigated by terminating the OHL at sealing end compound and cabling into the proposed Gala North Substation.

Section 3. Gala North to new 132kV OHL

Table 5 sets out the findings of the appraisal of Route Options 3A and 3B. The table should be read in conjunction with Figure 8 which illustrates key routeing considerations within Section 3 and Figure 9 which illustrates landscape character.

Table 5 Assessment of Route Options: Section 3 Gala North to new 132kV OHL

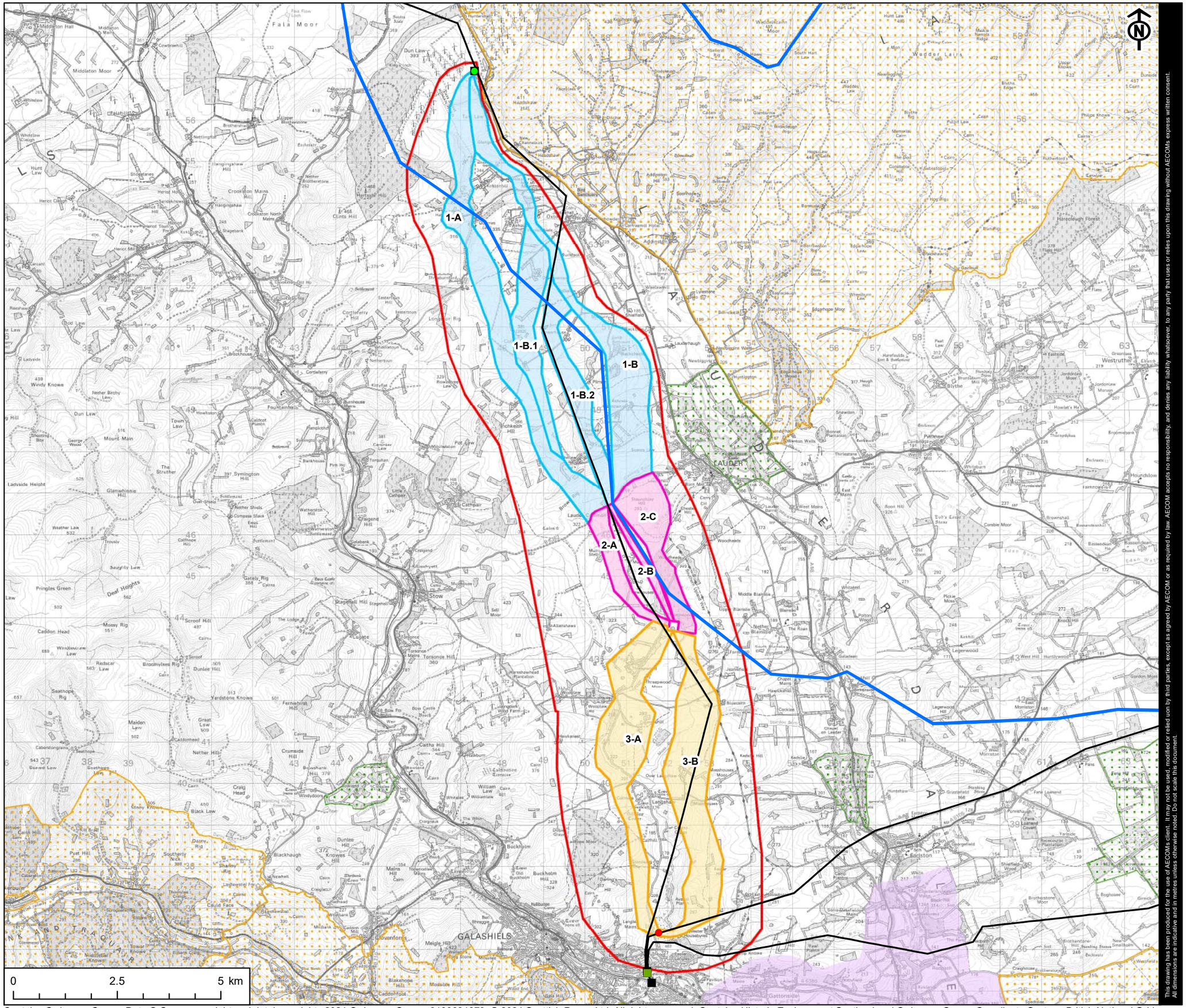
Topic	Route Option 3A	Route Option 3B
Landscape Character	This route option is located within the Undulating Upland Fringe LCT and largely occupies the eastern slopes of undulating hills. The landscape is defined by a network of agricultural fields with interspersed woodland boundaries in the north and more open fields east of the Allan Water. The watercourse itself is lined with belts of deciduous woodland, whilst a local road follows the eastern edge. Towards the south this route option comprises medium sized and more regular fields where boundaries are perpendicular to the route option. The route crosses another watercourse and band of mature trees before running in line with the local road leading south from residential properties and a farm. Careful routeing of the OHL should avoid the more intricate wooded parts of the landscape whilst taking advantage of the lower slopes and road corridor in part to concentrate the impression of change away from the more exposed uplands.	This route option is located within the Undulating Upland Fringe LCT and is characterised by large fields of improved pasture. Other landscape elements include some very limited linear bands of trees interspersed throughout. The southern part of this route option comprises a block of native woodland. An existing 132kV OHL follows the northern half of this route option. Landform is more steeply sloping from west to east towards the Allan Water which is beyond this route option to the west. Whilst there would be a short period of time in which there would be a concentration of wirescape within parts of this route option until the existing OHL line is dismantled the more open pasture landscape could accommodate an OHL with limited impact on more valued landscape elements.
Visual Amenity	Residential properties within the route option include three farmsteads which are partially enclosed by shelterbelt planting. The small settlement of Langshaw is situated to	Residential properties within this route option include two farmsteads towards the north, one of which is partially enclosed by woodland. The Southern Upland Way borders a very small

Topic	Route Option 3A	Route Option 3B
	the immediate east of the route option. There are no recreational routes within this route option. The main road between Lauder and Galashiels passes through the central and northern part of this route option. There is the potential some local informal paths traverse the route option between Lahope Moor and the main road. Careful siting on lower slopes to backcloth the route would limit the impression of change from more elevated and distant views experienced by users of The Southern Upland Way to the east.	part of the route in the north but then runs in parallel to the east for much of the route at a similar elevation where there are likely to be open views of an OHL. The existing OHL which would be dismantled is currently visible in views from similar sections of the Southern Upland Way. Careful routeing within this route should take advantage of the more elevated upland backcloth some distance to the west, which could provide a degree of backclothing to an OHL.
Ecology and Biodiversity	There are three statutory ecological designations of the highest or high environmental value within or close to the route option: • Threepwood Moss SAC and SSSI lies to the east of the route option south of the proposed Gala North Substation. The route option is sufficiently far enough away from the site that it should not be affected. • River Tweed SAC which includes a number of its tributaries. The route option lies to the west of the Allan Water which is part of the SAC. It is considered to be sufficiently far enough away that it should not be affected. • Colmslie Hill Junipers SSSI lies within the route option, however there is scope to route within the option to the west or east of it. There are no sites of moderate or low environmental value within or close to the route option.	There are two statutory ecological designations of the highest or high environmental value within or close to the route option: • Threepwood Moss SAC and SSSI lies to the west of the route option south of the proposed Gala North Substation. The route option is sufficiently far enough away from the site that it should not be affected. • River Tweed SAC which includes a number of its tributaries. The Allan Water may require to be spanned subject to the final design of the 'end point' where the Grid Connection tees in to the new Galashiels to Eccles 132kV OHL. The SAC could be spanned with towers sufficiently sited away from the Allan Water to reduce the potential for impacts. • Avenil Hill and Gorge SSSI lie to the west of the route option and is avoided. It is located sufficiently far enough away that it should be affected.

Topic	Route Option 3A	Route Option 3B
		There are no sites of moderate or low environmental value within or close to the route option. Ellwynd Wood and Meadow lies sufficiently far enough south that it should not be affected.
Cultural heritage	There is a small number of historic environment designations of the highest or high environmental value within or near to the route option: • A grade C listed building, Threepwood Cottage lies within the route option. This can be avoided to the east or west but there is the potential for setting impacts. • Two grade B listed buildings lie within the vicinity of the route option and their setting may be affected. Wooplaw Cottage to the west of the option and Hillslap Tower to the east. • Two scheduled monuments lies to the east of option at Langshaw; Langshaw Tower and Colmslie Tower both of which could experience setting impacts.	There are no historic environment designations of the highest or high environmental value within the route option. Two scheduled monuments (Langshaw Tower and Colmslie Tower) and one listed building (Hillslap Tower) lie to the west of the option and may experience setting impacts.
Forestry and woodland	There are a number of small woodland blocks and shelterbelts present throughout the option. This includes sites identified on the NWSS. The size and distribution of woodland as well as the presence of the constraints limits opportunities to avoid it. Aa result some tree removal is unavoidable.	There are a number of small woodland blocks and shelterbelts present throughout the option. This includes two adjacent sites identified on the NWSS to the south between the Allan Water and Easter Hill. This option provides some scope to avoid the NWSS woodlands, however, smaller undesignated woodland such as shelterbelts may be impacted.
Water resources	The route option crosses a small number of watercourses including watercourses which drain into the Allan Water which is part of the River Tweed SAC.	The route option crosses a small number of watercourses including watercourses which drain into the Allan Water which is part of the River Tweed SAC.

Topic	Route Option 3A	Route Option 3B
	Where watercourses require to be crossed they are not considered to present a significant constraint as they could be spanned by an OHL.	Where watercourses require to be crossed they are not considered to present a significant constraint as they could be spanned by an OHL.
Ground conditions	There is a small area of class 5 peatland which requires to be crossed west/south of the proposed Gala North Substation. This area is unavoidable so some impacts on peat are likely to occur.	There is a small area of class 5 peatland which requires to be crossed south east of the proposed Gala North Substation. This area is unavoidable so some impacts on peat are likely to occur.
Land use	The route option crosses land for which the land capability for agriculture is classed as s 4.1 or 4.2 (i.e. capable of producing a narrow range of crops). There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.	The route option crosses land for which the land capability for agriculture is classed as s 4.1 or 4.2 (i.e. capable of producing a narrow range of crops). There would be a loss of land associated with the footprint of OHL towers, however, this is not considered likely to result in a significant effect on land use.
Tourism and recreation	There are no formal tourism or recreation attractions present within or in close proximity to the route option.	The Southern Upland Way lies to the east of the route option and largely parallels it for the length of option 3b. There would be no physical impact on the long distance walking route, however, an OHL could impact on the amenity of users of it.
Engineering	An engineering review of the route option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of a continuous OHL within the section. The key constraints related to a requirement to cross the existing 132kV OHL (P route) as well as topography with elevations greater than 200mAOD resulting in increased ice and wind loading was also identified as a constraint.	An engineering review of the route option highlighted a small number of routeing constraints or future design considerations but none which would prevent the development of a continuous OHL within the section. The key constraints related to a requirement to cross the existing 132kV OHL (P route) as well as topography with elevations greater than 200mAOD resulting in increased ice and wind loading was also identified as a constraint.

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



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AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY
- Study Area
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point
- Garden and Designed Landscape
- Special Landscape Area
- National Scenic Area

SPT Transmission Substation
- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network
- Existing 132kV
- Existing 400kV

Route Options
- Section 1
- Section 2
- Section 3

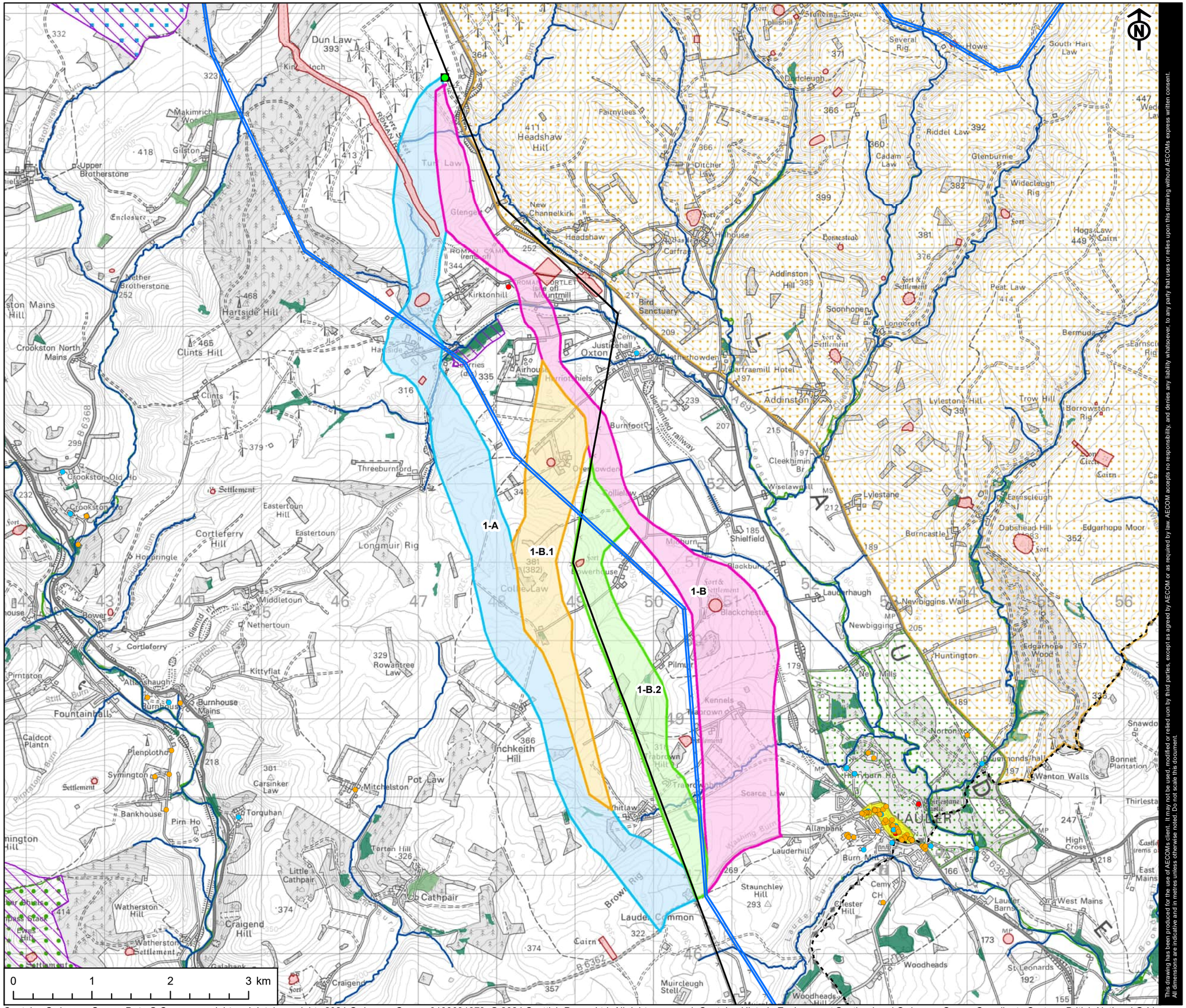
TITLE
Figure 5
Overview of Route Options

REFERENCE
DL_20240611_RR_5_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Dun Law Wind Farm Substation - Start Point
- Category A Listed Buidling
- Category B Listed Building
- Category C Listed Building
- Southern Upland Way
- Watercourse
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Garden and Designed Landscape
- Special Landscape Area
- Ancient Woodland
- Native Woodland
- Scheduled Monument
- Conservation Area

SPT Transmission Substation
- Existing 132kV

SPT Overhead Transmission Network
- Existing 132kV
- Existing 400kV

Section 1 Route Options
- 1-A
- 1-B
- 1-B.1
- 1-B.2

TITLE
Figure 6
Section 1 Route Options: Dun Law Wind Farm to West of Lauder

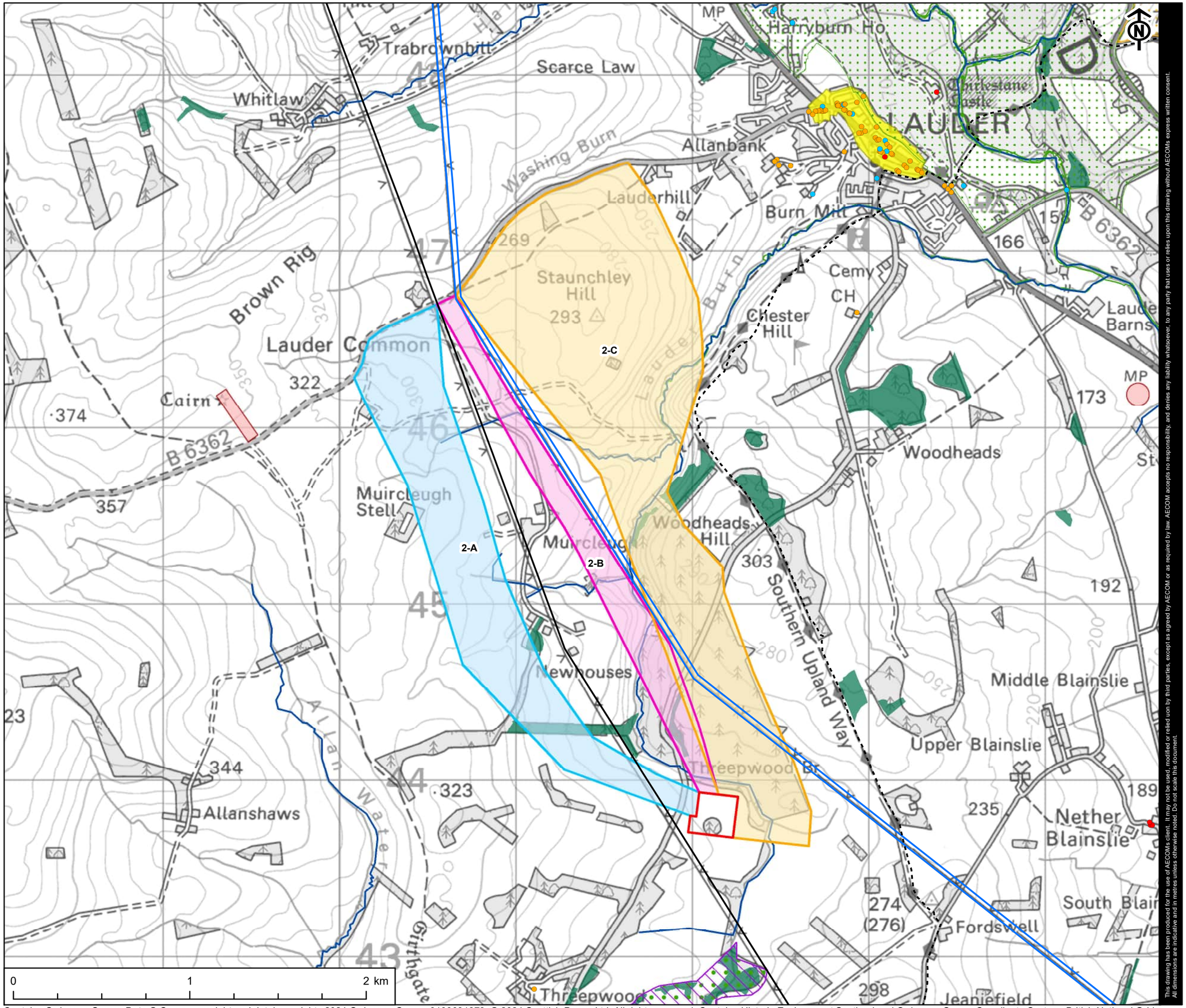
REFERENCE
DL_20240611_RR_6_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Coordinate System: British National Grid

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



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AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Gala North Substation Boundary
- Category A Listed Buidling
- Category B Listed Building
- Category C Listed Building
- Southern Upland Way
- Watercourse
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Garden and Designed Landscape
- Special Landscape Area
- Native Woodland
- Scheduled Monument
- Conservation Area

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

Section 2 Route Options

- 2-A
- 2-B
- 2-C

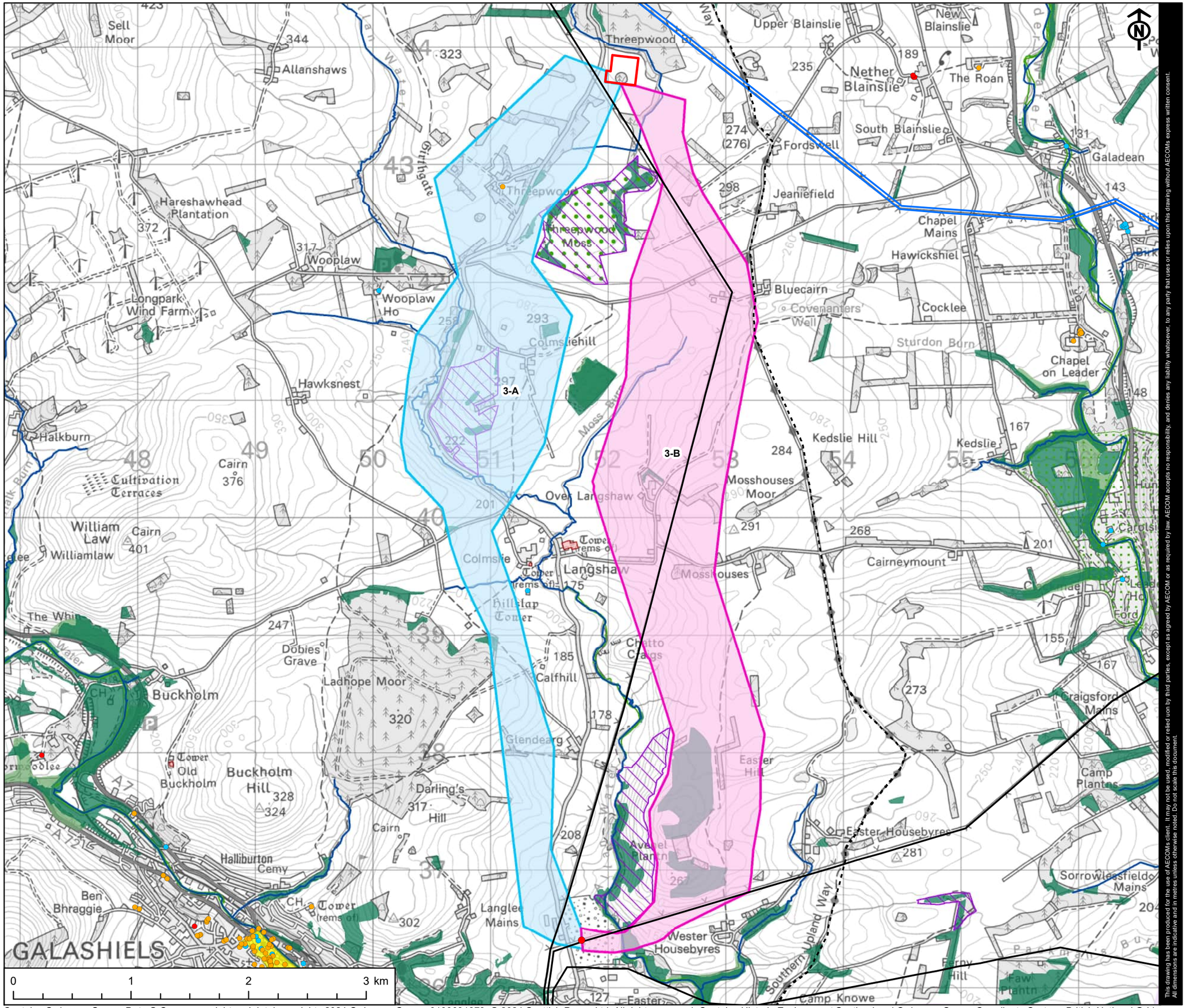
TITLE
Figure 7
Section 2 Route Options: West of Lauder to Gala North Substation

REFERENCE
DL_20240611_RR_7_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY
- Gala North Substation Boundary
- New Galashield to Eccles 132kV OHL - End Point
- Category A Listed Buidling
- Category B Listed Building
- Category C Listed Building
- Southern Upland Way
- Watercourse
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Garden and Designed Landscape
- Special Landscape Area
- National Scenic Area
- Ancient Woodland
- Native Woodland
- Scheduled Monument
- Conservation Area

SPT Overhead Transmission Network
- Existing 132kV
- Existing 400kV

Section 3 Route Options
- 3-A
- 3-B

TITLE
Figure 8
Section 3 Route Options: Gala North Substation to New Galashiels to Eccles 132kV OHL

REFERENCE
DL_20240611_RR_8_v1

SHEET NUMBER
1 of 1

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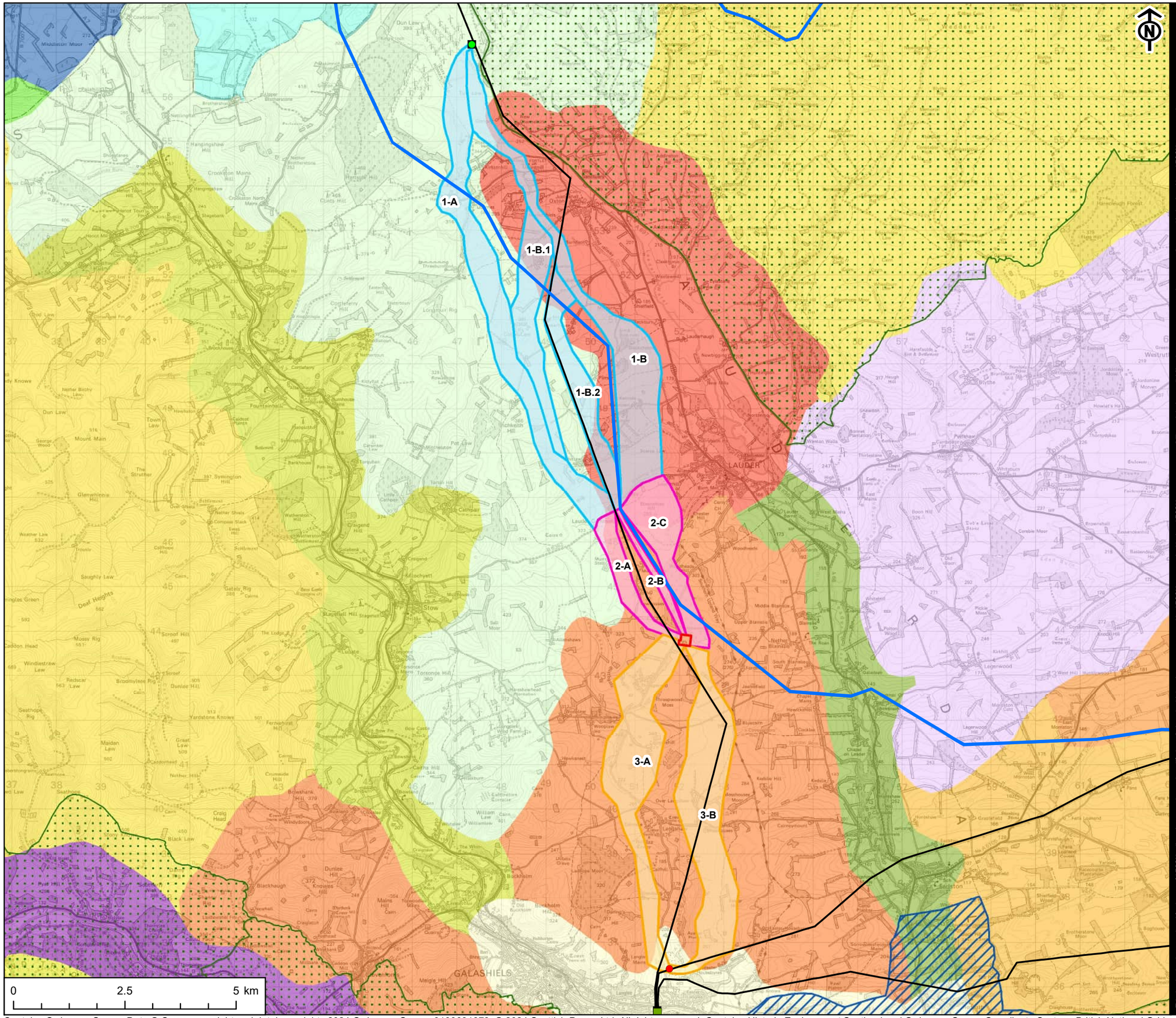
11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



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AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point
- Special Landscape Area
- National Scenic Area

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

Route Options

- Section 1
- Section 2
- Section 3

Landscape Character

- Dissected Plateau Moorland
- Lowland Margin
- Lowland Margin with Hills
- Pastoral Upland Fringe Valley
- Pastoral Upland Valley
- Plateau Grassland - Borders
- Plateau Grassland - Lothians
- Plateau Moorland - Lothians
- Rolling Farmland - Borders
- Settled Upland Fringe Valley
- Southern Uplands with Scattered Forest - Borders
- Undulating Upland Fringe
- Upland Fringes - Lothians
- Upland Valley with Mixed Farmland
- Upland Valley with Woodland

TITLE
Figure 9
All Route Options - Landscape Character

REFERENCE
DL_20240611_RR_9_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

06.
The Preferred Option

6. The Preferred Option

6.1 Summary of Options Considered

Figure 10 provides an overview of the route options which have been identified and assessed. The following sections comparatively assess the route options within each Section of the Study Area.

Section 1. DLWF to west of Lauder

Two primary route options were identified within Section 1 from DLWF to the B6362 west of Lauder: route option 1A, a westerly route approximately 11.4km long and route option 1B, an easterly route approximately 10.5km. Two sub-options 1B-1 and 1B-2 were also identified which would allow the development of continuous route options between from 1B to 1A with a total length of approximately 10-11km.

The key issues in this section relate to topography, presence of scheduled monuments, scattered settlement and potential crossings of the existing 132kV and 400kV OHLs (P route and ZA route).

It is considered preferable to route within route option 1B on the lower slopes of Turf Law (between 300 and 330mAOD) adjacent to the A68 south/south east towards Glengelt. There is a telecommunications mast on the hillslopes to the north west of Glengelt, however, there is a narrow corridor between the mast and property through which an OHL could be routed. If greater separation is required between an OHL route and the telecommunications mast, the alternative would be to follow the slopes of Turf Law and route on the western extent of the option, however, this would require to parallel a gas pipeline. However, this is considered preferable to routeing within route option 1A which would require an OHL to traverse the western slopes or top of Turf Law (between 370 and 390mAOD) where there is potential to break the skyline while also crossing Dere Street, a linear scheduled monument which extends broadly north to south. While an OHL could span the scheduled monument it would likely have impacts on its setting.

Routeing south/south east of Glengelt and the telecommunications mast, route option 1B crosses a ‘gap’ between the gas pipeline and scheduled monument (Oxton Roman Camps). Routeing through the ‘gap’ there would be the potential for setting impacts on the scheduled monument, however, the comparable section of Route Corridor 1A would also have potential setting impacts on two scheduled monuments, firstly a fort to the west of Kirkton Hill and secondly scooped homesteads to the south of Hartside Farm.

Routeing southwards route option1B crosses a valley through which Mountmill Burn flows. It is preferable for OHL routes to be located to the west of the option through this area which would require the gas pipeline to be crossed. However, routeing to the west avoids an Above Ground Installation (AGI) which appears to be associated with the gas pipeline as well as avoids a small woodland. Routeing to the west of the woodland allows it to be used for screening and/or backclothing views from the east and west respectively.

From this location there are sub-options to either continue within route option 1B or route within sub-options 1B-1 or 1B-2. Options 1B-1 and 1B-2 both require the Grid Connection to cross the existing 400kV OHL (ZA route) while Option 1B does not. However, routeing within 1B would require the existing 132kV OHL (P route) to be crossed. The key issues are:

- Option 1B is the least elevated of the three options crossing land typically between 200 and 240mAOD between the lower slopes of Collie Law and Trabrown Hill. The key environmental constraint relates to a pinch point where the existing 400kV OHL and a scheduled monument (Blackchester Fort) create a pinch point. However, it is possible to avoid this pinch point and reduce setting impacts by routeing further east on lower lying land towards the A68.
- Sub-option 1B-1 is the most elevated of the three options crossing the upper slopes of Collie Law between 340 and 380mAOD. The key environmental constraints comprise a scheduled monument (Overhowden, Henge) and residential properties. This option is further constrained by woodland planting around Overhowden.
- Sub-option 1B-2 crosses the lower slopes of Collie Law between 270 and 320mAOD. This option largely follows the route of the existing 132kV OHL (P-route). There is a single scheduled monument, a fort to the west of Bowerhouse. While this can be avoided there is the potential for setting impacts.

Overall route option 1B is considered the most preferred option in Section 1. The topography within Section 1 broadly slopes eastwards towards the A68 while also undulating north to south. While it is routed on the lower hillslopes closer to the A68, the upper hillslopes to the west provide some backclothing and would reduce skylining for much of route option 1B. The undulating landform north to south creates localised areas where a new OHL would be more prominent as well as some engineering challenges but this is preferable to route option 1A. While option 1A is set further back from the A68 it is on more elevated land which is less preferable in engineering terms and it would also have a greater impact on sites of high environmental value, namely a number of scheduled monuments which it would impact. The sub-options are not considered to provide any benefits and the requirement for them to cross the existing 400kV OHL (ZA route) makes them less preferred in engineering terms.

Section 2. West of Lauder to Gala North

Three route options were identified within Section 2 from the B6362 to the proposed Gala North Substation: route option 2A, the western most route approximately 3.4km long, route option 2B, a central route approximately 3.2km long and route option 2C, an easterly route approximately 3.5km long.

With the exception of a small number of residential properties which are avoided there are no constraints of the highest or high environmental value which affect the route options. All of the options have the potential to impact on LBSs at Lauder Common and therefore these are not considered to help differentiate between the options. The key issues in this section relate to proximity to potential crossing of existing 132kV and 400kV overhead

lines (P route and ZA route), overhead line entries into the proposed Gala North Substation, potential removal of woodland to the north of the Substation and impacts on users of the Southern Upland Way to the east.

Route option 2A, the western most option avoids the forestry to the north of the proposed Gala North Substation, however, there are smaller scattered woodland blocks present including a shelterbelt of mixed deciduous woodland which extends across the option and would require to be removed.

Route option 2B is highly constrained by its proximity to the existing 132kV and 400kV OHLs to the west and east respectively (P route and ZA route). The existing OHLs combined with properties to the west make this the least preferred option within section 2.

Route option 2C is the eastern most option traversing the slopes of Staunchley Hill and Woodheads Hill and through the forestry block to the north of the proposed Gala North Substation. Existing landform to the north would help to backcloth and screen views an OHL from the east including Lauder. Subject to detailed route design this option requires removal of much of the forestry block to the north of the proposed Gala North Substation resulting in localised landscape impacts. This section of the route option would also be apparent views from the Southern Upland Way to the east. Retaining some forestry block to the west of route option 2C would help to reduce the prominence of an OHL in views from the Southern Upland Way, however, some impacts are unavoidable. The existing 400kV OHL (ZA route) will be turned into the proposed Gala North Substation which provides opportunities for the Grid Connection to stay east of it and avoid a requirement to cross it. As described in section2 of this RCD the Grid Connection will be undergrounded into the proposed Gala North Substation. Subject to the location of a sealing end compound this provides opportunities to mitigate potential impacts on views from the Southern Upland Way including potential wirescape impacts.

Considering the route options within Section 2 and noting the preference within Section 1 for option 1B it is considered preferable to continue an overall route for the Grid Connection to the east using route option 2C. **Route option 2C is considered most preferable.** Crossing from 1B to 2A would require crossing the 132kV and 400kV OHLs (P route and ZA route) including crossing P route twice in order to connect at the proposed Gala North Substation. As result the preferred option in Section 2 is route option 2B. In developing a detailed alignment careful consideration should be given to the siting of a sealing end compound and cable routeing into the proposed Gala North Substation in order to reduce potential environmental impacts as far as possible including the loss of woodland and potential impacts on users of the Southern Upland Way.

Section 3. Gala North to new 132kV OHL

Two route options were identified within Section 3 from the proposed Gala North Substation to the new Galashiels to Eccles 132kV OHL: route option 3A, a westerly option approximately 8,1km long and route option 3B an easterly option approximately 7.7km long.

Key issues in this section relate to ecological designations, scattered settlement, woodland, proximity to or views from the Southern Upland Way and the existing 132kV OHL route (P route).

There are pinch points on both route options to the south of Gala North Substation, however, these tend to be more acute on route option 3A where a combination of residential properties, Threepwood Moss SAC and SSSI, Colmsliehill Junipers SSSI and scattered woodland blocks and shelterbelts would affect the directness of an OHL route and potentially increase the overall route length. In particular, the location of Colmsliehill Junipers SSSI creates a key constraint limiting routes to the west of the option following the landform above the Allan Water which is part of the River Tweed SAC, or to the east of the option in much closer proximity to residential property at Colmsliehill.

In Route Corridor 3B the main constraints relate to the existing 132kV OHL (P route), proximity to residential properties, the potential to impact on views from the Southern Upland Way (to the east of the corridor) as well as a requirement to cross the Allan Water. It would be possible to avoid crossing P route by routeing to the east of it on the margins of the corridor, however, this would potentially result in the Grid Connection breaking the skyline where it crosses the western slopes of Kedslie Hill. It would be preferable for an OHL within route option 3B to be located to the west of the corridor on lower lying land where landform would help backcloth and/or screen views of it, particularly from the Southern Upland Way, but this would require P route to be crossed south of Mosshouses Moor/east of Langshaw. South of this area route option 3B largely avoids areas of the highest or high environmental value with the exception of potentially crossing the Allan Water (part of the River Tweed SAC) subject to the precise tee-in to the new Galashiels to Eccles 132kV OHL.

Overall route option 3B is the most preferred option within Section 3 of the study area. Landscape character and the distribution of constraints affecting route option 3A make it less preferable compared to route option 3B. While sections of route option 3B would potentially impact on views from the Southern Upland Way, landform provides opportunities to reduce these by screening and/or backclothing views of an OHL.

6.2 The Preferred Route Option

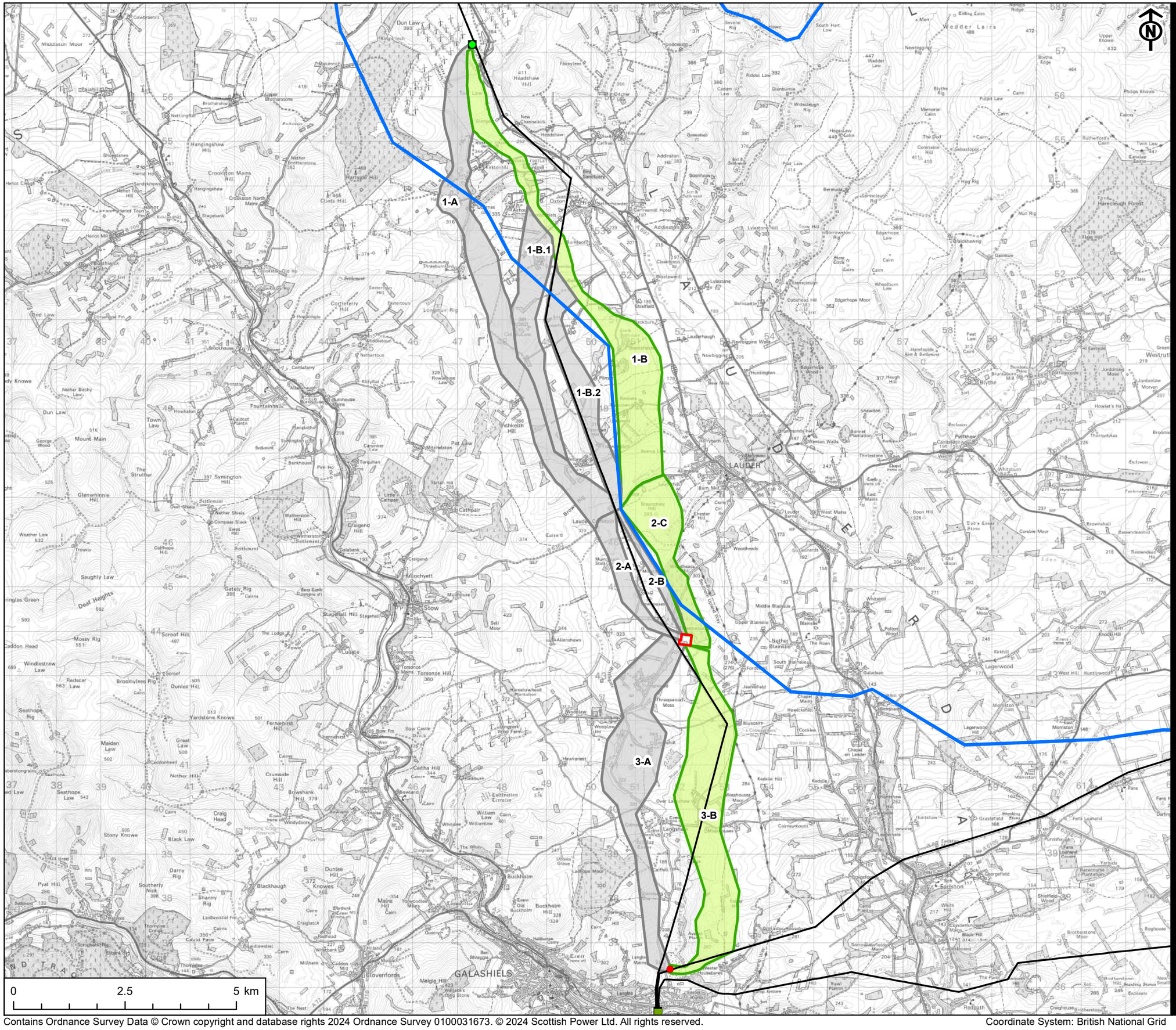
While in general any combination of the route options within sections 1, 2 and 3 would enable a continuous OHL route from DWLF to the new Galashiels to Eccles 132kV OHL via the proposed Gala North Substation, a preferred route option has been identified comprising:

- Section 1. DLWF to west of Lauder – the preferred route option is option 1B.
- Section 2. west of Lauder to Gala North – the preferred route option is option 2C.
- Section 3. Gala North to new 132kV OHL – the preferred route option is 3B.

The overall preferred route option formed of 1B, 2C and 3B is approximately 23km long and illustrated in Figure 11. This option is considered to best balance environmental, technical and economic factors. It is technically feasible and economically viable and,

relative to other route options, avoids or reduces impacts on the environment and people who live, work and undertake recreational activities in the area as far as possible.

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



Scale @ A3 1:80,000

Coordinate System: British National Grid

AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

Route Options

- Preferred Route Option
- Less Preferred Route Option

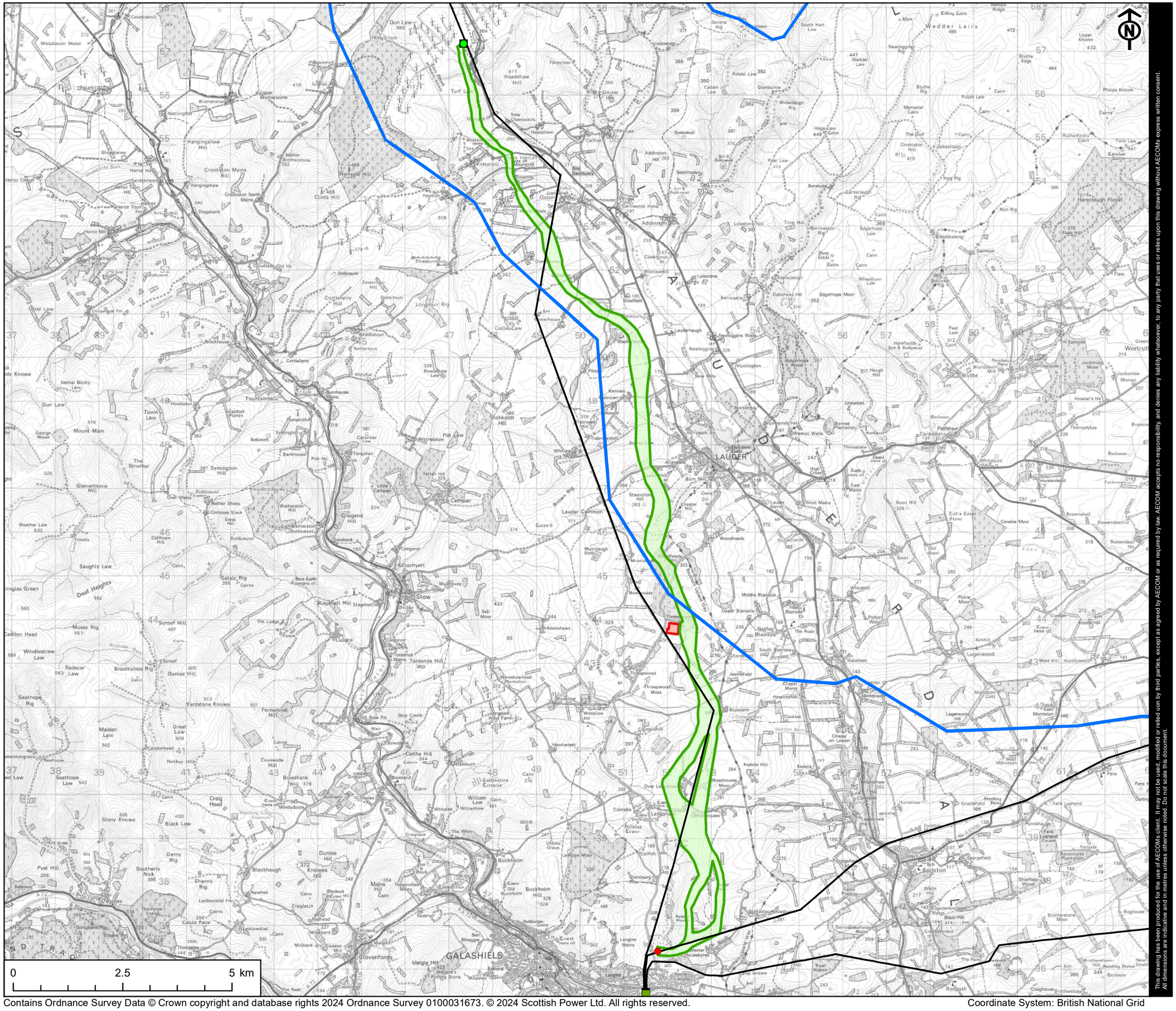
TITLE
Figure 10
Grid Connection - Route Options

REFERENCE
DL_20240611_RR_10_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



Coordinate System: British National Grid

AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Preferred Route Option
- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

TITLE
Figure 11
Preferred Route Option

REFERENCE
DL_20240611_RR_11_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

07. Consultation and Next Steps

7. Consultation and Next Steps

7.1 Consultation on the Grid Connection

As set out in section 1 of this Routeing and Consultation Document (RCD), SPEN will be required to apply to Scottish Ministers for consent under section 37 of the Electricity Act 1989 for consent for the Grid Connection. At the same time, SPEN will also apply for deemed planning permission for the Grid Connection and associated works under Section 57(2) of the Town and Country Planning (Scotland) Act 1997.

While there are no formal pre-application requirements for consultation in seeking section 37 consent and deemed planning permission, SPEN is embracing best practice as promoted by Scottish Government Energy Consents Unit which encourages applicants to engage with stakeholders and the public in order to develop their proposals in advance of such applications being made. Prior to the submission of the consent application, SPEN will carry out two rounds of consultation with stakeholders and the public:

- Phase One Consultation: Public consultation on the preferred route option, as detailed in this RCD.
- Phase Two Consultation: Public consultation on a more detailed route alignment for the Grid Connection anticipated to be in 2025.

7.2 Approach to and Objective of Phase 1 Consultation

SPEN attaches great importance to the effect that its works may have on the environment and local communities and is very keen to hear the views of local people to help it inform the development of the Grid Connection in the most effective way.

The overall objective of the consultation process is to ensure that all parties with an interest in the Grid Connection have access to accurate and up to date information and are provided with the opportunity to inform SPEN's proposals during the pre-application stage. In addition, it is intended that the key issues identified through this process can be recorded and presented to decision makers to assist the planning process.

SPEN has taken steps to identify stakeholders and interested parties prior to this Phase 1 Consultation and is committed to continuing engagement with all stakeholders and communities both during and outside consultation periods.

7.3 Consultees

To ensure that all residents and other stakeholders potentially affected by the Grid Connection are consulted, SPEN has defined a consultation zone which includes all residential and business addresses within 500m of the preferred option. However, any member of the public (whether living within or outside the consultation zone) is welcome to participate in the consultation and comment using one of the channels outlined within this RCD.

The consultation will include the following broad groups:

- Statutory and non-statutory consultees, including community councils;
- Elected members of whose constituencies are within the consultation zone;
- Homes and businesses within the consultation zone;
- Known local interest and community groups within the consultation zone; and
- The public in general.

7.4 Phase 1 Consultation Launch and Duration

Phase 1 Consultation will run from Wednesday 12th of June to Wednesday the 10th of July. Prior to the consultation, an advert will appear in the local weekly newspaper at least seven days before the first exhibition. The consultation will be posted out to homes, businesses, and known local interest and community groups within the local area, making them aware of the start of the Phase1 Consultation and inviting them to take part.

7.5 Sources of Information about the Consultation

In addition to this RCD, a project booklet has been prepared which provides a summary of the Grid Connection and how to participate in Phase 1 Consultation. A project website (https://dunlaw.consultation.ai/) has also been set up which provides information about the Grid Connection and hosts a library of publicly available documents for viewing or downloading:

7.6 Providing feedback

There will be several ways for people to make comments:

- By completing a feedback form online at https://dunlaw.consultation.ai/
- By completing a feedback form at one of the in-person events
- By email to dunlawext@spenergynetworks.co.uk
- By freepost returning the feedback form sent out with the project booklet to homes and businesses in the consultation zone

In-person events

SPEN will hold three in-person drop-in events which will be attended by members of the project team who will be available to answer questions about the Grid Connection.

Feedback can be provided in-person by completing a feedback form at the event:

- Monday 24 June at Langlee Community Centre, Marigold Drive, Galashiels TD1 2LP from 3pm to 7pm.
- Tuesday 25 June at Lauder Public Hall, The Avenue, Lauder, TD2 6TD from 3pm to 7pm.

- Thursday 27 June at Carfraemill Hotel, near Oxton, Lauder, TD2 6RA from 3pm to 7pm.

Online

People will be able to make comments online at https://dunlaw.consultation.ai/ using the online version of the feedback form.

Email

SPEN will also accept comments relating to the Phase 1 Consultation by e-mail to dunlawext@spenergynetworks.co.uk

Post

A hard-copy feedback form is enclosed with the project booklet and will be available at public exhibitions, for download from the website or by request via email to dunlawext@spenergynetworks.co.uk

7.7 Responding to Feedback

The responses received to the Phase 1 Consultation will be evaluated by SPEN and published in the form of a Consultation Feedback Report. Although SPEN may not be able to respond to all individual comments, people will be able to request to be kept informed by email as and when there are developments in the Grid Connection, including the availability of the Consultation Feedback Report and confirmation of the Proposed Option.

Appendices

Appendix A The Holford Rules

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.

Note on Rule 1

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

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

Examples of areas of highest amenity value which should be considered are:

Special Area of Conservation (SAC)

Special Protection Area (SPA

Ramsar Site

National Scenic Areas (NSA)

National Parks

National Nature Reserves (NNR)

Protected Coastal Zone Designations

Sites of Special Scientific Interest (SSSI)

Schedule of Ancient Monuments

Listed Buildings

Conservation Areas

World Heritage Sites

Historic Gardens and Designed Landscapes

Rule 2

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

Note on Rule 2

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.

Impacts on the setting of historic buildings and other cultural heritage features should be minimised.

If there is an existing transmission line through an area of high amenity value and the surrounding land uses.

Rule 3

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

Note on Rule 3

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

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

Choose tree and hill backgrounds in preference to sky background 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 the towers will be reduced and views of the line will be broken by trees.

Notes on Rules 4 and 5

Utilise background and foreground features to reduce the apparent height and domination of towers from main viewpoints.

Minimise the exposure of numbers of towers on prominent ridges and skylines.

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).

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

Rule 6

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

Note on Rule 6

In all locations minimise confusing appearance.

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

Rule 7

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

Note on Rule 7

When a line needs to pass through a development area, route it so as to minimise as far as possible the effect on development.

Alignments should be chosen after consideration of impacts on the amenity of existing development and on proposals for new development.

When siting substations take account of the impacts of the terminal towers and line connections that will need to be made and take advantage of screening features such as ground form and vegetation.

Supplementary Notes

a. Residential Areas: Avoid routeing close to residential areas as far as possible on grounds of general amenity.

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

c. Alternative Lattice Steel Tower Designs: In addition to adopting appropriate routeing, evaluate where appropriate the use of alternative lattice steel tower designs available where these would be advantageous visually, and where the extra cost can be justified.

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

Further Notes on Clarification to The Holford Rules

Line Routeing and People

The Holford Rules focused on landscape amenity issues for the most part. However, line routeing practice has given greater importance to people, residential areas etc. The following notes are intended to reflect this.

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

b. In rural areas avoid as far as possible dominating isolated house, farms or other small-scale settlements.

c. Minimise the visual effect perceived by users of roads, and public rights of way, paying particular attention to the effects of recreational, tourist and other well used routes.

Supplementary Notes on the Siting of Substations

a. Respect areas of high amenity value (see Rule 1) and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area.

b. Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas.

c. Use space effectively to limit the area required for development, minimizing the effects on existing land use and rights of way.

d. Alternative designs of substations may also be considered, e.g. ‘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.

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

Appendix B Thematic Constraints Plans

B.1 Landscape Designations

B.2 Landscape Character

B.3 Ecology Designations

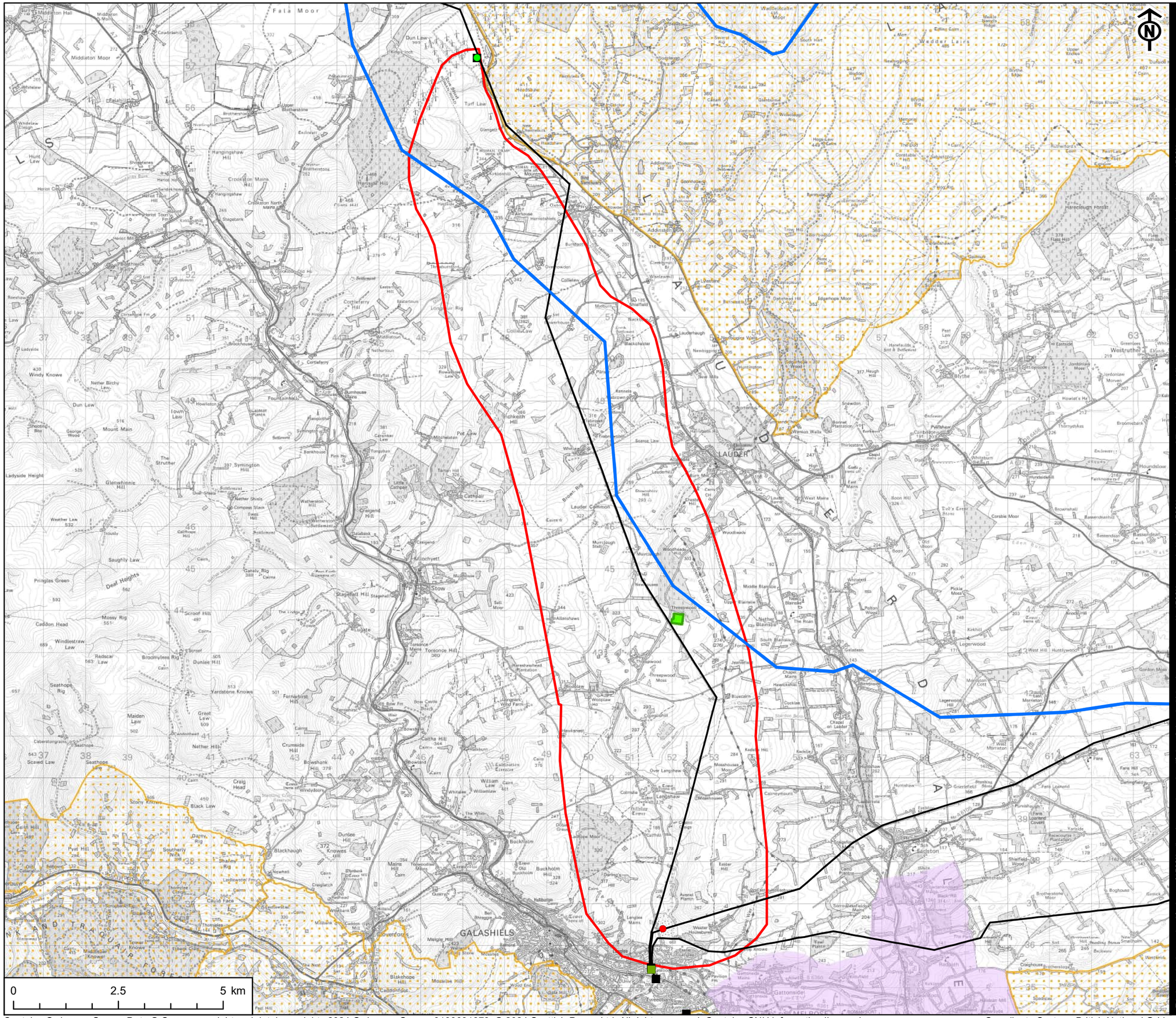
B.4 Cultural Heritage

B.5 Trees and Woodland

B.6 Topography

B.7 Existing Transmission and Distribution System

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



Coordinate System: British National Grid

AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Study Area
- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point
- National Scenic Area
- Special Landscape Area

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

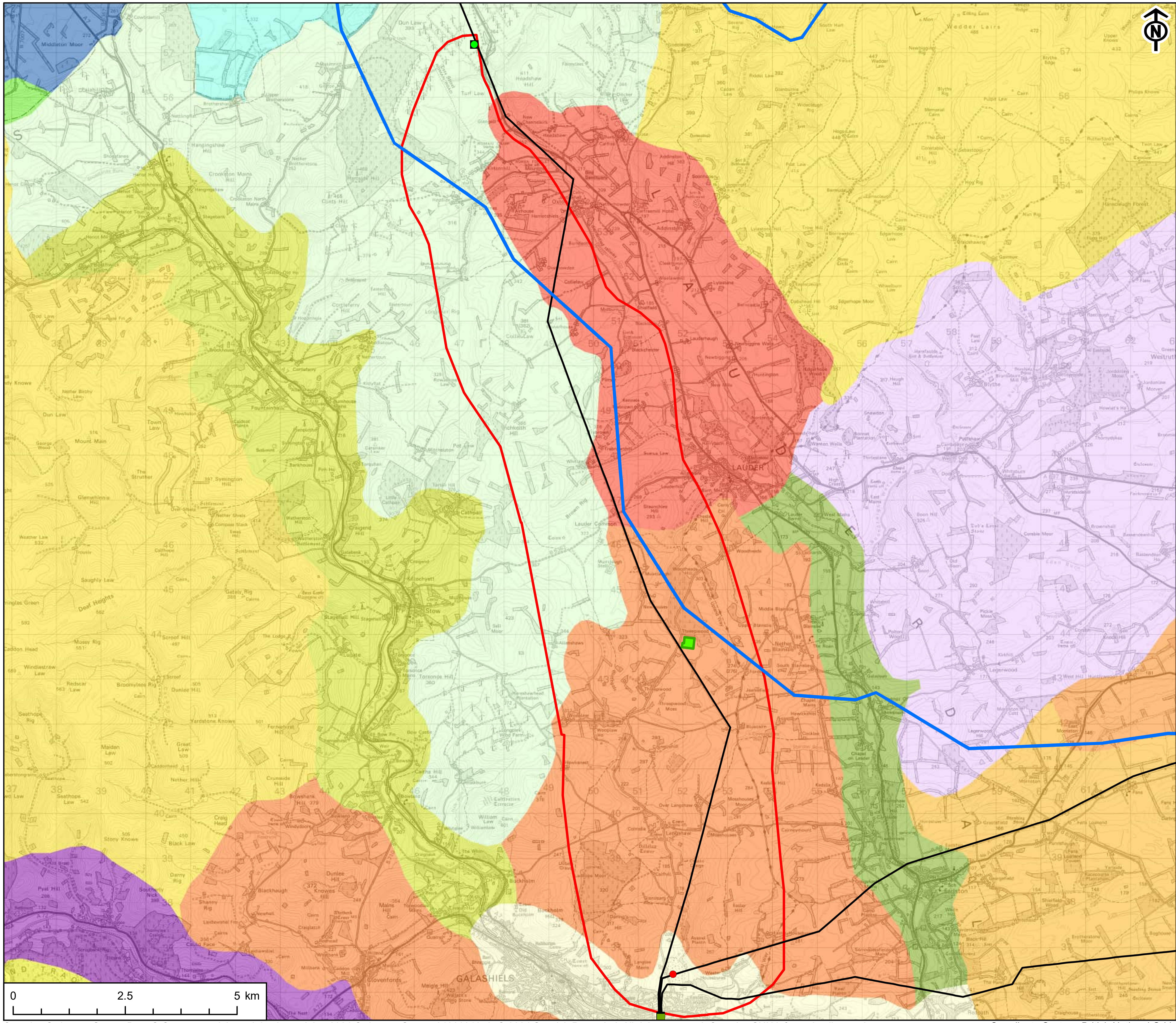
TITLE
Appendix B - Figure B.1
Landscape Designations

REFERENCE
DL_20240611_RR_B.1_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



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AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY
- Study Area
- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point

SPT Transmission Substation
- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network
- Existing 132kV
- Existing 400kV

Landscape Character
- Dissected Plateau Moorland
- Lowland Margin
- Lowland Margin with Hills
- Pastoral Upland Fringe Valley
- Pastoral Upland Valley
- Plateau Grassland - Borders
- Plateau Grassland - Lothians
- Plateau Moorland - Lothians
- Rolling Farmland - Borders
- Settled Upland Fringe Valley
- Southern Uplands with Scattered Forest - Borders
- Undulating Upland Fringe
- Upland Fringes - Lothians
- Upland Valley with Mixed Farmland
- Upland Valley with Woodland

TITLE
Appendix B - Figure B.2
Landscape Character

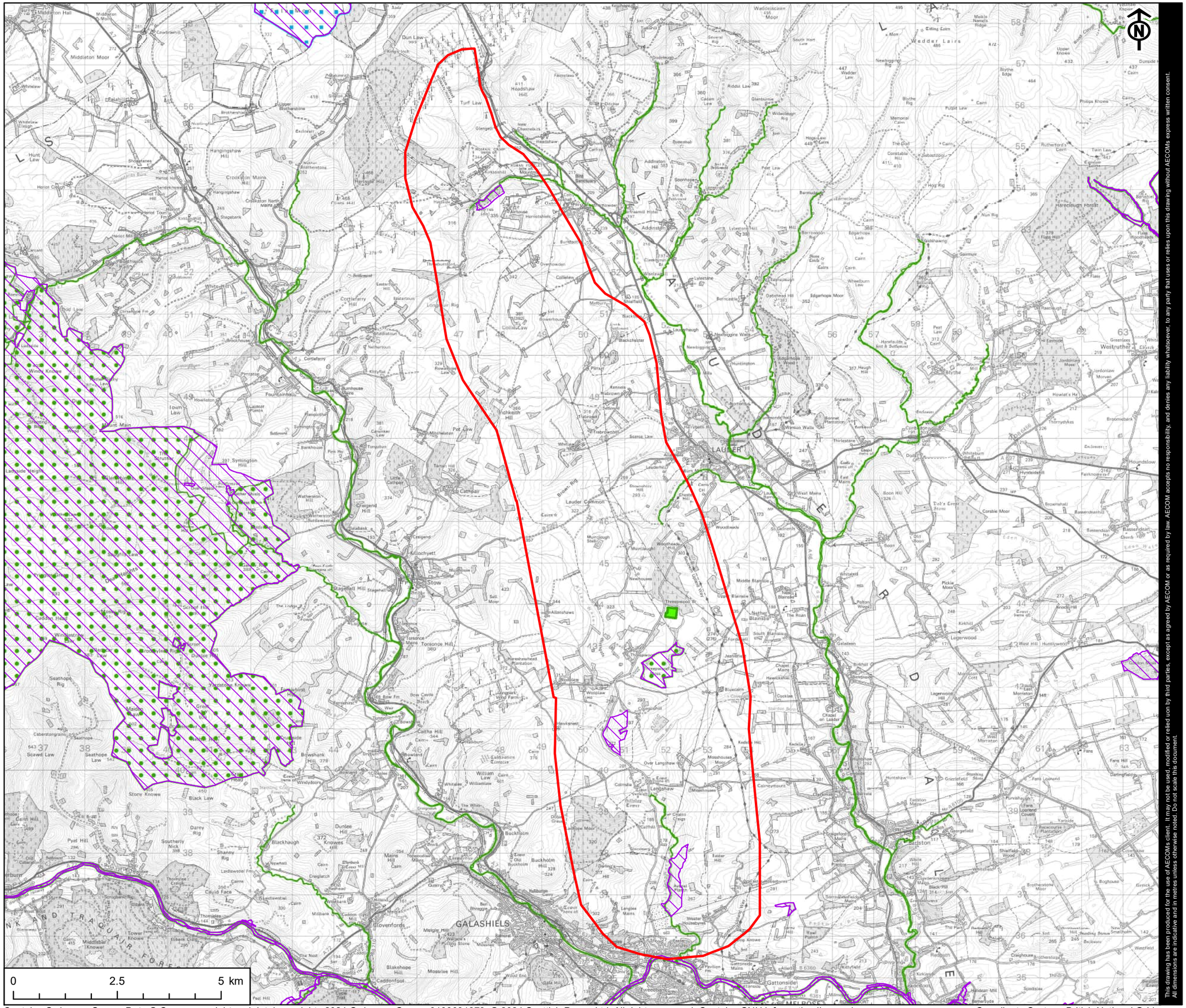
REFERENCE
DL_20240611_RR_B.2_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Coordinate System: British National Grid

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



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Coordinate System: British National Grid

AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY
- Study Area
- Gala North Substation Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

TITLE
Appendix B - Figure B.3
Ecology Designations

REFERENCE
DL_20240611_RR_B.3_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

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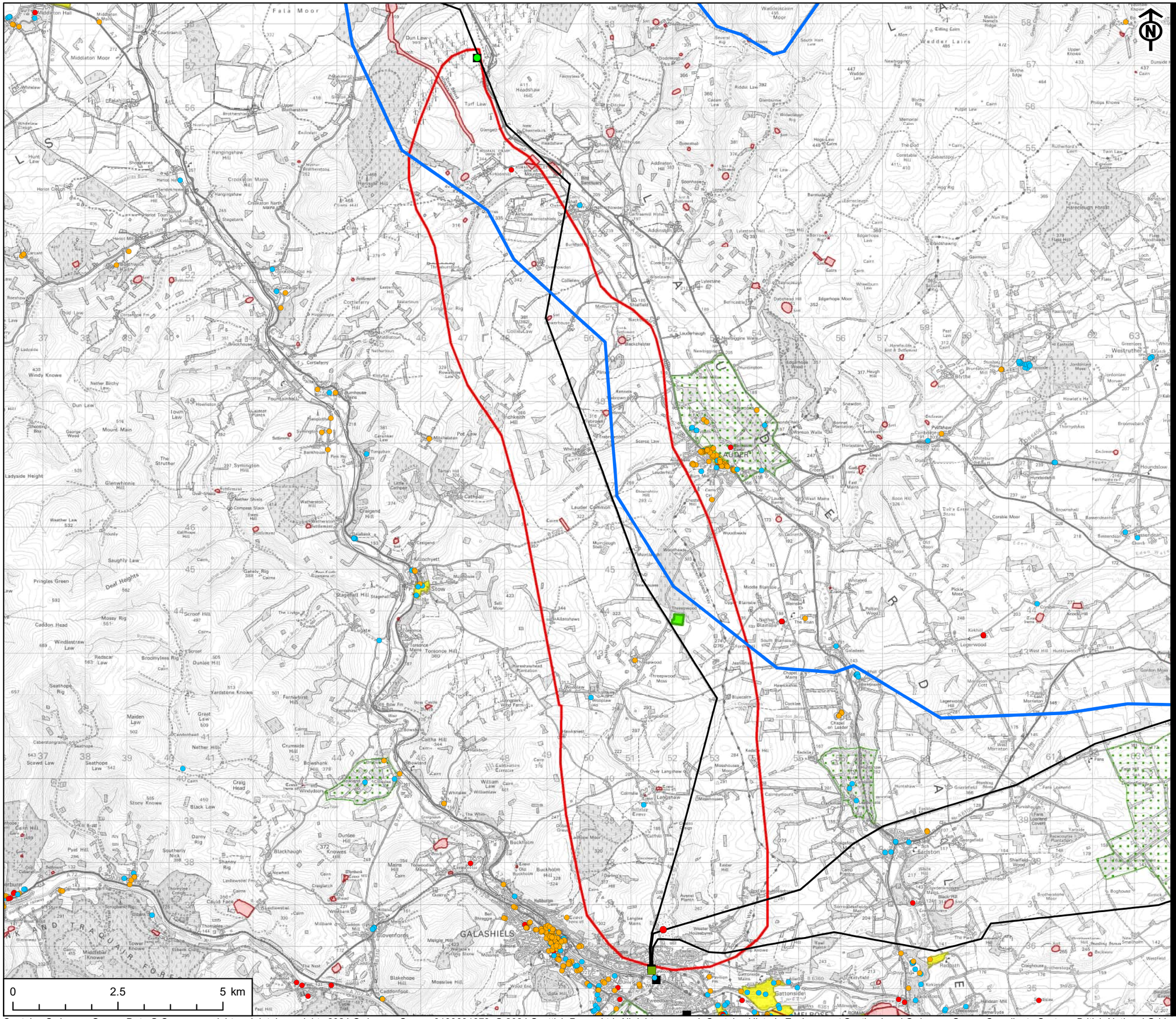


AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Study Area
- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point
- Category A Listed Buidling
- Category B Listed Building
- Category C Listed Building
- Garden and Designed Landscape
- Scheduled Monument
- Conservation Area

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

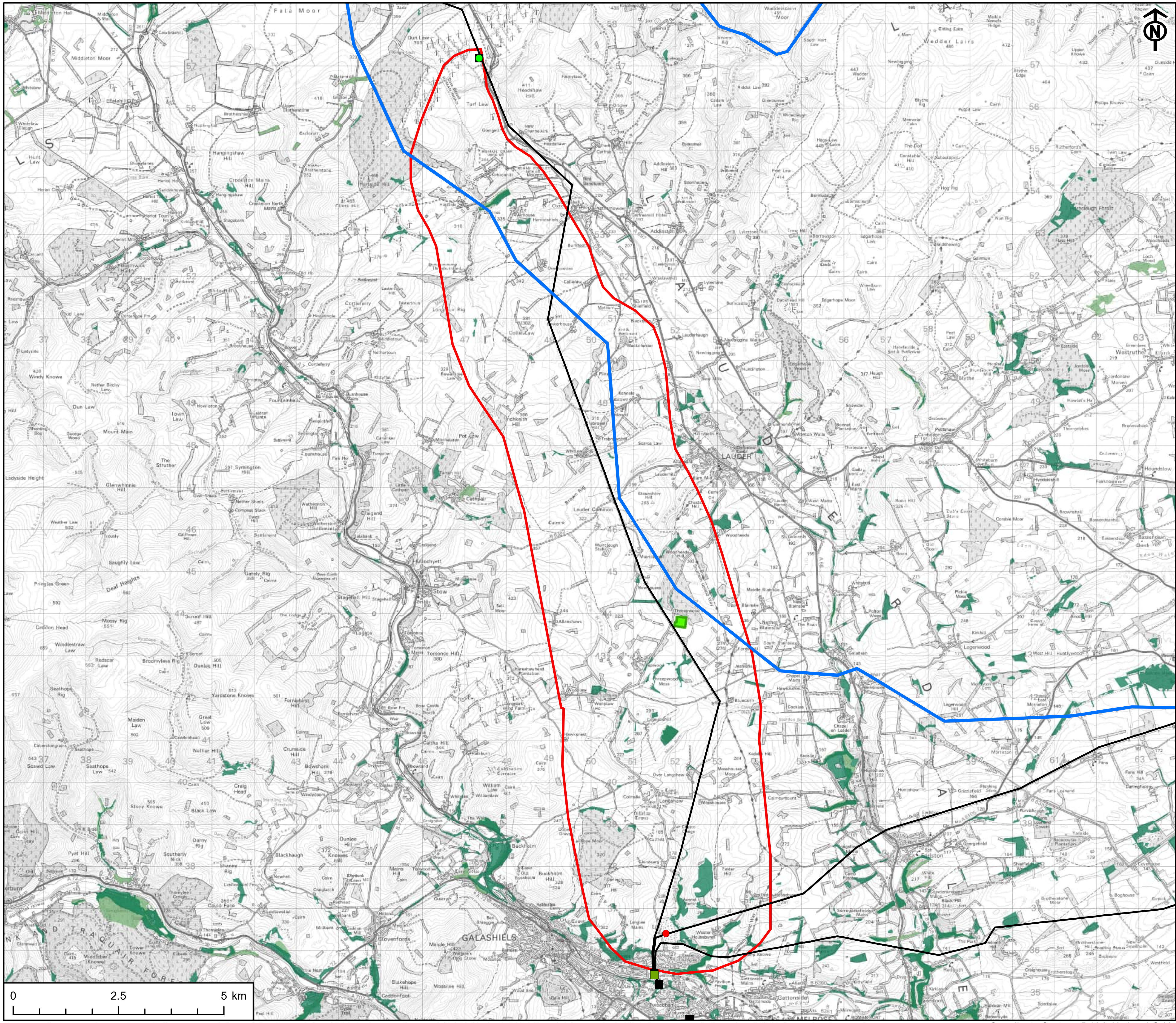
TITLE
Appendix B - Figure B.4
Archaeological and Heritage Designations

REFERENCE
DL_20240611_RR_B.4_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



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Coordinate System: British National Grid

AECOM

PROJECT

Dun Law Wind Farm Grid Connection

CLIENT

SP Energy Networks

KEY

- Study Area
- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point
- Ancient Woodland
- Native Woodland

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

TITLE

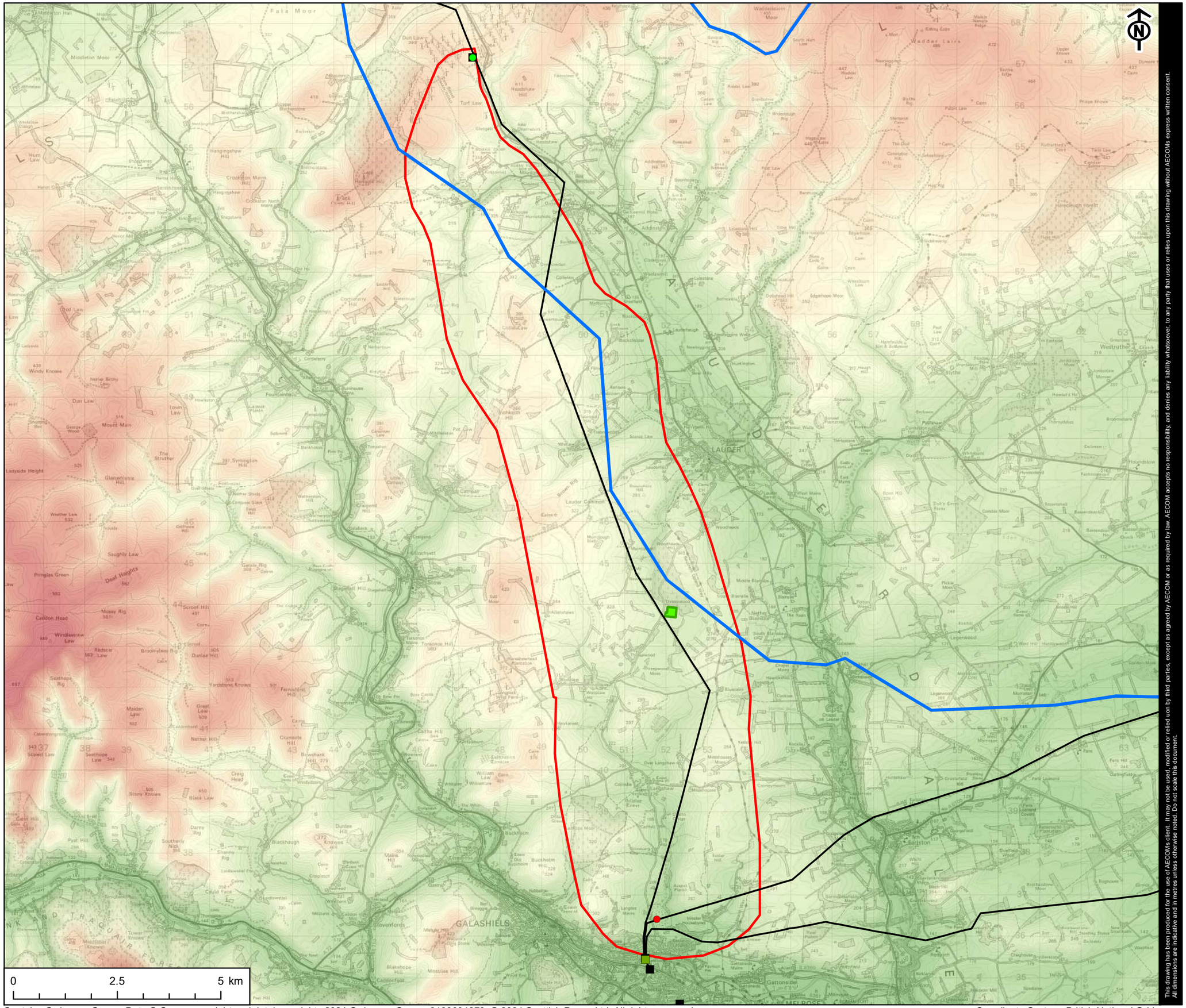
Appendix B - Figure B.5
Trees and Woodland

REFERENCE

DL_20240611_RR_B.5_v1

SHEET NUMBER	DATE
1 of 1	11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



Coordinate System: British National Grid

AECOM

PROJECT
Dun Law Wind Farm Grid Connection

CLIENT
SP Energy Networks

KEY

- Study Area
- Gala North Substation Boundary
- Dun Law Wind Farm Substation - Start Point
- New Galashield to Eccles 132kV OHL - End Point

SPT Transmission Substation

- Existing 33kV
- Existing 132kV

SPT Overhead Transmission Network

- Existing 132kV
- Existing 400kV

Ground Elevation (m) - OS Terrain 50

- High : 659.5
- Low : 34.2

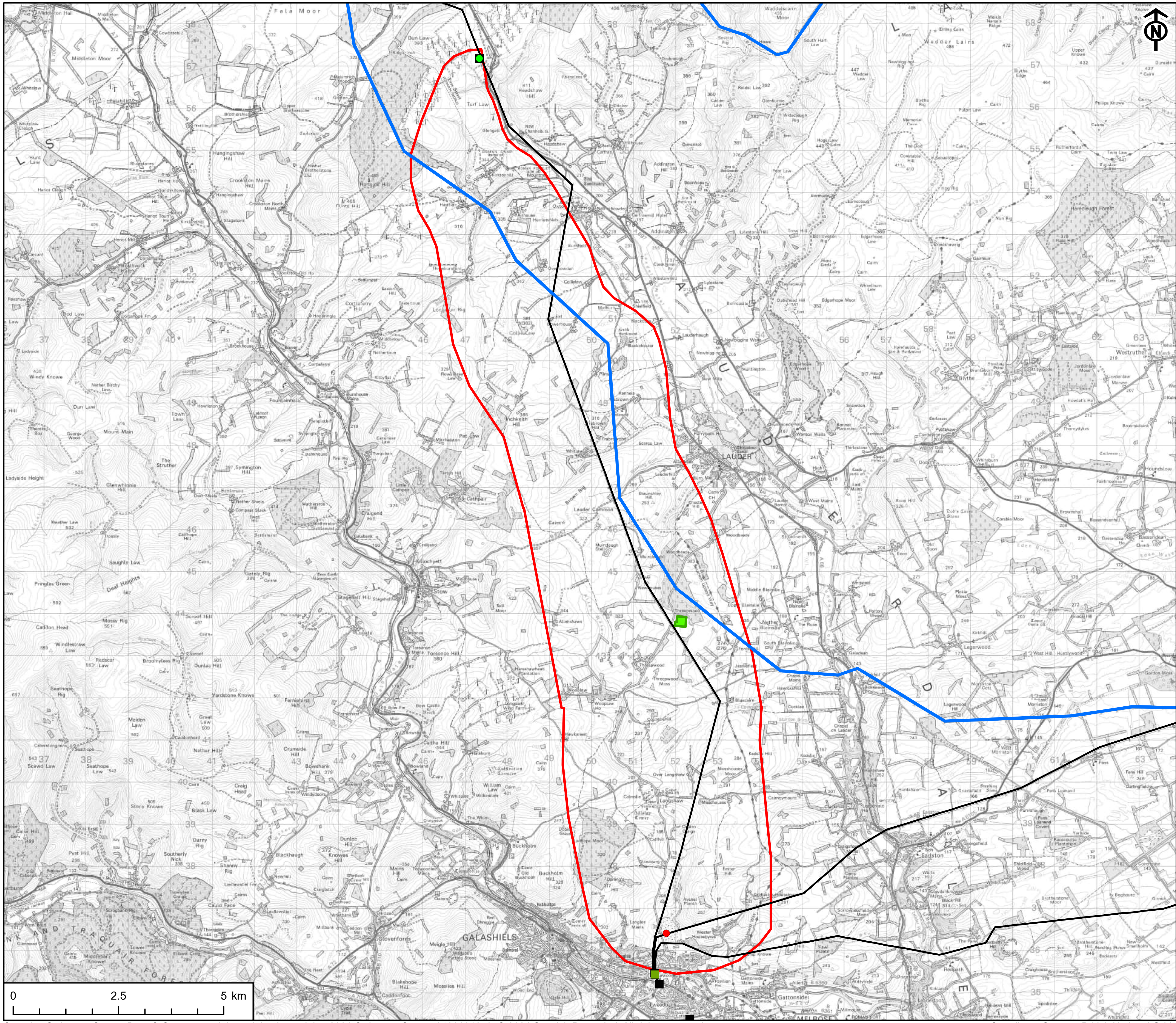
TITLE
Appendix B - Figure B.6
Topography

REFERENCE
DL_20240611_RR_B.6_v1

SHEET NUMBER
1 of 1

DATE
11/06/24

Project Management Initials: DR Designer: ER Checked: JG Approved: DR



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Coordinate System: British National Grid

AECOM

PROJECT

Dun Law Wind Farm Grid Connection

CLIENT

SP Energy Networks

KEY

Study Area

Gala North Substation Boundary

Dun Law Wind Farm Substation - Start Point

New Galashield to Eccles 132kV OHL - End Point

SPT Transmission Substation

Existing 33kV

Existing 132kV

SPT Overhead Transmission Network

Existing 132kV

Existing 400kV

TITLE

Appendix B - Figure B.7
Existing Transmission and Distribution System

REFERENCE

DL_20240611_RR_B.7_v1

SHEET NUMBER	DATE
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Appendix C Grid Connection - Routeing Considerations

Appraisal topic	Study area constraints and features	Routeing objectives	Grid Connection routeing considerations
Landscape	• Eildon and Leaderfoot National Scenic Area (NSA) (Holford Rule 1) • Lammermuir Hills Special Landscape (SLA) (Holford Rule 2) • Landscape character: Landscape Character Types (LCTs) (Holford Rules 4, 5 and 6)	• To develop route options which avoid designated landscapes as far as possible while accounting for other routeing considerations. • To develop route options which take account of landscape character and sensitivities and utilise landform and vegetation to reduce potentially adverse landscape impacts as far as possible.	There are no nationally designated landscapes within the Study Area, however, the Eildon and Leaderfoot NSA lies just outside of it to the south/south east and can be avoided. The Lammermuir Hills SLA lies to the east of the A68 east of the Study Area. The Study Area has been designed to avoid route options within the SLA. Landscape character varies between more open upland landscapes in the north to predominantly improved pasture through undulating landform within a broader valley to the south. The route should be designed to use landform to backcloth OHL routes and minimise the impression of change within the landscape.
Visual amenity	• Settlements (Holford Rules – Supplementary Notes and Clarifications) • Scattered individual rural properties (Holford Rules – Supplementary Notes and Clarifications)	• To develop route options which avoid settlements as far as possible while accounting for other routeing considerations. • To develop route options which avoid or reduce potentially adverse impacts on visual amenity from scattered rural properties as far as possible.	Settlements within the Study Area are limited to small rural settlements. Oxton and Lauder are both located adjacent to the A68 on the eastern extent of the Study Area. Galashiels lies to the south of the Study Area where route options terminate. There are several Core Paths within the Study Area and small sections cross the route corridors. The Southern Upland Way is located to the east of all route options but within the Study Area where users are likely to

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			experience more open and expansive views west. The use of more upland landform and existing woodland to backcloth the OHL would minimise visual effects. There are scattered farmsteads and small clusters of properties throughout the Study Area which can limit opportunities for avoidance subject to other routeing considerations. A 150m zone or 'trigger for consideration' is applied to rural properties with route options seeking to avoid these as much as possible.
Ecology and Biodiversity	• Airhouse Wood Site of Special Scientific Interest (SSSI) (Holford Rule 1) • River Tweed Special Area of Conservation (SAC) (Holford Rule 1) • Threepwood Moss SAC (Holford Rule 1) • Colmsliehill Junipers SSSI (Holford Rule 1) • Avenil Hill and Gorge SSSI (Holford Rule 1)	• To develop route options which avoid sites designated for nature conservation or ecological interests as far as possible in order to avoid potentially adverse effects on the sites and their qualifying features.	There are a number of internationally and nationally designated sites (i.e. sites of the highest environmental value) present within the Study Area, however, they typically occupy small, discrete areas and can be avoided subject to route selection. The River Tweed SAC is an exception as it is a linear site and comprises the River as well as its tributaries and one or more of these may require to be crossed subject to route selection.
Cultural heritage	• Scheduled Monuments (Holford Rule 1) • Listed Buildings (Holford Rule 1) • Conservation Areas (Holford Rule 1)	• To develop route options which avoid sites designated for archaeological heritage conservation purposes in order to reduce potentially adverse effects on them including upon	There are a number of archaeological and heritage conservations sites present within the Study Area which are considered to be sites of the highest environmental value.

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	• Inventory Gardens and Designed Landscapes (GDL) (Holford Rule 1) • Inventory Historic Battlefields (Holford Rule 1) • Non-designated assets identified via Canmore Database (Holford Rule 2)	their setting as much as possible.	Scheduled monuments are typically relatively small sites which can be avoided subject to route selection, however, subject to proximity there is the potential for setting effects to occur. The Soutra to Turf Law Roman Road which lies to the north of the Study Area is an exception as it comprises a linear feature which extends broadly north-south to the west of DLWF. Listed buildings are present throughout the Study Area. While the majority are located within settlements (in particular Lauder) which would otherwise be avoided, there are some scattered listed buildings present within more rural areas. Thirlestane Castle GDL is located to the east of the A68 on the outer extent of the Study Area and can be avoided.
Forestry and woodland	• Ancient Woodland Inventory (Holford Rules 1, 4 and 5) • Native Woodland Survey of Scotland (Holford Rules 2, 4 and 5)	• To develop route options which avoid crossing forestry and woodland, in particular Ancient Woodland Inventory sites, as much as possible.	There are a number of scattered woodlands present throughout the Study Area including woodlands which are identified on the Ancient Woodland Inventory. Woodland, in particular Ancient Woodland should be avoided as much as possible, however, this may need to balanced against other constraints as well as Holford Rule 3 regarding changes of direction. Where possible route options should utilise the screening or backclothing provided by landform and where possible woodland to in line Holford Rules 4 and 5.

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Water resources	• Waterbodies / watercourses • Flood Zones • Drinking water protection zones	• To develop route options which adhere to a minimum 50m separation zone from watercourses or bodies. • To develop route options which avoid crossing flood zones or where they cannot be avoided crosses at their narrowest point.	There are a number of watercourses present within the Study Area, however, they are not considered to significantly constrain the development of route options. While route options should maintain a minimum separation distance of 50m this should ensure watercourses could be spanned by routes where they require to be crossed. There are no surface water drinking water protection zones present within the Study Area. The Study Area is underlain by a groundwater drinking protection zone (Peebles, Galashiels and Hawick), however, this does not influence the development of nor differentiate between route options.
Ground conditions	• Priority Peatland Habitats (Class 1 and Class 2) (Holford Rule 1) • Peatland Habitats (Classes 3, 4 and 5)	• To develop route options which avoid, or where this is not possible minimise, the loss of peatlands.	The Carbon and Peatland Map of Scotland shows the distribution of carbon and peatland classes (class 1 which is representative of nationally important carbon rich soils and deep peat to class 5 which is representative of peat soils). The majority of Peatland Habitats occupy relatively small, discrete areas and are therefore avoidable subject to other routeing considerations. Class 1 Peatland Habitats are present within the Study Area coinciding with Threepwood Moss SAC/SSSI. Elsewhere Peatland Habitats are largely Class 3 or 5.
Land use	• Agricultural land	• To develop route options while giving consideration to the	The majority of land within the Study Area is classified as 4.1, 4.2, 5.1 or 5.2 i.e. is land which is suitable for a

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		nature and extent of agricultural land and potential adverse impact on agricultural land use.	narrow range of crops or for use as improved grassland. A narrow area on the east of the Study Area between Oxton and Lauder is classified as 3.2. Overall, agricultural land use is not a significant routeing consideration.
Tourism and recreation	• Walking and cycling routes including the Southern Upland Way and Core Paths. • Recreational attractions including Lauder Golf Course.	• To develop route options which avoid or reduce impacts on formal and informal recreation areas as much as possible.	There are a small number of formal and informal recreational areas present within the Study Area including linear features comprising walking and cycling routes and site-based constraints such as Lauder Golf Course.
Technical or engineering parameters	• Existing transmission and distribution infrastructure (Holford Rule 6) • Topography, elevation and slide slopes.	• To develop route options while taking account of proximity to and requirement to cross existing transmission and distribution infrastructure and the potential for wirescape effects. • To develop route options taking account of topography, elevation and side slopes or other areas which could affect affect constructability and/or operability.	There are a number of existing OHLs within the study area including the existing 132kV OHL from DLWF to Galashiels (known as 'P route') which will be removed upon completion of the Grid Connection as well as a 400kV OHL (known as 'ZA route') which will be turned into the proposed Gala North Substation where the Grid Connection will also connect. The Grid Connection will also connect to a terminal tower on an existing 132kV OHL north of Langlee, Galashiels. Elevations and slope angle have been derived from digital terrain data and reviewed as part of technical reviews of route options in order to identify any constructability challenges. Engineering reviews consider elevation in three bands (<200mAOD/low

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			risk, 200-500mAOD/medium risk and >500mAOD/high risk).