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The Glenmuckloch to Glenglass Reinforcement Project

Environmental Impact Assessment – Scoping Report

December 2019

Planning & EIA
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1 Introduction

- 1.1 This Scoping Report has been prepared by LUC on behalf of SP Energy Networks (SPEN). It relates to proposals to construct and operate a new 132kV overhead line (OHL) supported on steel lattice towers, as part of a transmission network reinforcement. The OHL is required to connect an air insulated substation adjacent to the Glenmuckloch Wind Farm and Pumped Storage Hydro (PSH) projects to the existing 132kV substation at Glenglass (hereafter referred to as the Glenmuckloch to Glenglass Reinforcement Project).
- 1.2 The location of the Glenmuckloch to Glenglass Reinforcement Project point of connection in relation to the existing network is shown on **Figure 1.1**.
- 1.3 This report accompanies SPEN's request for a Scoping Opinion which is being sought from the Scottish Ministers in accordance with Regulation 12 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ('The EIA Regulations').
- 1.4 Scoping is an early step in the Environmental Impact Assessment (EIA) process, the objective of which is to ensure the assessment process focuses on the likely significant effects associated with a project. Scoping also provides an opportunity for consultees to comment on the proposed methodologies for the EIA, identify sources of baseline information and raise any specific issues requiring assessment.

The Applicant

- 1.5 SPEN¹ owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly owned subsidiaries SP Transmission Plc (SPT) and SP Distribution Plc (SPD). Its transmission network is the backbone of the electricity system in its area carrying large amounts of electricity at high voltages from generating sources such as windfarms and power stations across long distances. The transmission network includes more than 4,000km of overhead lines and more than 360km of underground cables. The electricity is then delivered via the distribution system serving two million customers, with 83,000 customers located in southwest Scotland.
- 1.6 As a transmission licence holder for central and southern Scotland, SPEN is required under section 9(2) of the Electricity Act 1989 to:
 - develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and
 - facilitate competition in the supply and generation of electricity.
- 1.7 SPEN also has the following obligations pursuant to its licence conditions:
 - To provide for new electricity generators wishing to connect to the transmission system in its licence area. SPEN is also obliged to ensure that the system is fit for purpose through appropriate reinforcements to accommodate the contracted capacity.
 - To plan and develop its transmission system in accordance with the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS) and in so doing take account of National Grid's obligations as system operator, to co-ordinate and direct the flow of electricity on, to and over the GB transmission system.
- 1.8 In response to statutory and licence obligations, SPEN are required to ensure that the transmission system is developed and maintained in an economic, coordinated and efficient manner in the interests of existing and future customers.

¹ SP Transmission plc is the holder of a transmission licence. The references below to SPEN in the context of statutory and licence duties and the application for section 37 consent below should be read as applying to SP Transmission plc

The Need for the Glenmuckloch to Glenglass Reinforcement project

- 1.9 In recent years, SPEN has received several connection requests from developers wishing to develop renewable energy schemes in the Sanquhar area of Dumfries and Galloway². Currently, the connection offers require each of these developments to connect into the existing 132kV substation at Glenglass.
- 1.10 SPEN has a statutory duty to develop and maintain an economic, co-ordinated and efficient network of electricity transmission and distribution. Therefore, to avoid multiple overhead lines from the renewable energy schemes converging into Glenglass, SPEN are proposing to reinforce the network via a new 132kV overhead line which will be shared by these renewable energy projects. To achieve this reinforcement, SPEN propose to construct and operate a new 132kV overhead line (OHL) supported on steel lattice towers from an air insulated substation on the site of the Glenmuckloch Wind Farm and Pumped Storage Hydro to the existing 132kV substation at Glenglass. Further details of the components of the Glenmuckloch to Glenglass Reinforcement Project are provided in **Chapter 2**.

Background to the Project

- 1.11 The Glenmuckloch to Glenglass Reinforcement Project was previously known as the Glenmuckloch 132kV Connection Project, as the overhead line was proposed to connect the PSH project to the existing network via an overhead line supported on L7 steel towers.
- 1.12 A routeing exercise was undertaken for the Glenmuckloch 132kV Connection Project in 2018, comprising a review of environmental, technical and economic considerations and the application of established step by step routeing principles to identify and appraise potential route options to establish the 'preferred' route for the new 132kV OHL. The methodology and findings of the routeing process for the previously titled Glenmuckloch 132kV Connection Project are presented in The Glenmuckloch 132kV Connection Project: Routeing and Consultation Report (January 2019).
- 1.13 Following identification of a preferred route, consultation with the general public, as well as with the local authority and statutory consultees³ was carried out on the Preferred Route from 26th February until 26th March 2019. Exhibitions were held in Kirkconnel and Sanquhar on 26th and 27th February 2019, from 1400 – 2000 hrs on each day, with representatives of SPEN and LUC present on both days.
- 1.14 No objections were raised from any statutory or non-statutory consultees. Feedback received through the consultation process has been taken account of by SPEN through a review process, culminating in the 'proposed' route, to be progressed to the next stage in the development process (see **Chapter 4**). Following the first round of consultation, SPEN published The Glenmuckloch 132kV and 33kV Connections Project: Summary of Feedback from First Round of Consultation (August 2019) document. The purpose of the report was to detail the feedback received to date, address feedback received during the first round of consultation and demonstrates how this feedback has influenced the Glenmuckloch to Glenglass Reinforcement Project.

The EIA and Consenting Process

Legislative Requirements for EIA

- 1.15 Schedules 1 and 2 to the EIA Regulations, define those developments for which an EIA is required. Schedule 1 (3) includes "*construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres*". Schedule 2(a) includes "*an electric line installed above ground with a voltage of 132 kilovolts or more*". The proposed grid

² These comprise Sanquhar II, Sandy Knowe, Glenmuckloch, Glenmuckloch PSH, Windy Rig and Twenty Shilling

³ listed in Appendix 2 of the Routeing and Consultation Document

connection at 132kV has therefore been determined as a Schedule 2 development under the EIA Regulations.

- 1.16 For Schedule 2 developments, EIA is not mandatory, and professional judgement is required as to the likelihood of the development resulting in significant environmental impacts, depending on the nature, size and location of the proposal. However, SPEN has considered that the proposed grid connection has the potential to have significant environmental impacts, and an EIA is required.
- 1.17 Furthermore, Schedule 9 (1) of the Electricity Act 1989 states that in formulating any 'relevant proposals', a person authorised to generate electricity:
- 1.18 "(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and
- (b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."
- 1.19 The EIA process will seek to avoid, reduce and where possible, offset likely significant impacts on the environment through an iterative design process for the proposed OHL. This will culminate in the production of an Environmental Impact Assessment Report (EIA Report) which will report on the effects of construction and operation of the Glenmuckloch to Glenglass Reinforcement Project.
- 1.20 The EIA Report will also consider the cumulative effects of the proposed new OHL with the other OHL connections which share the project study area and have progressed to the application stage of development (or other projects specifically requested by Statutory Consultees to be included).

Application for S37 Consent

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

Structure of the Report

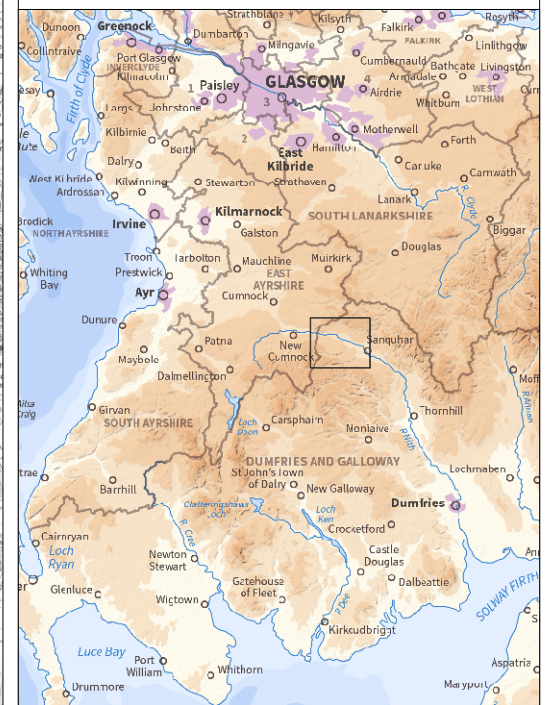
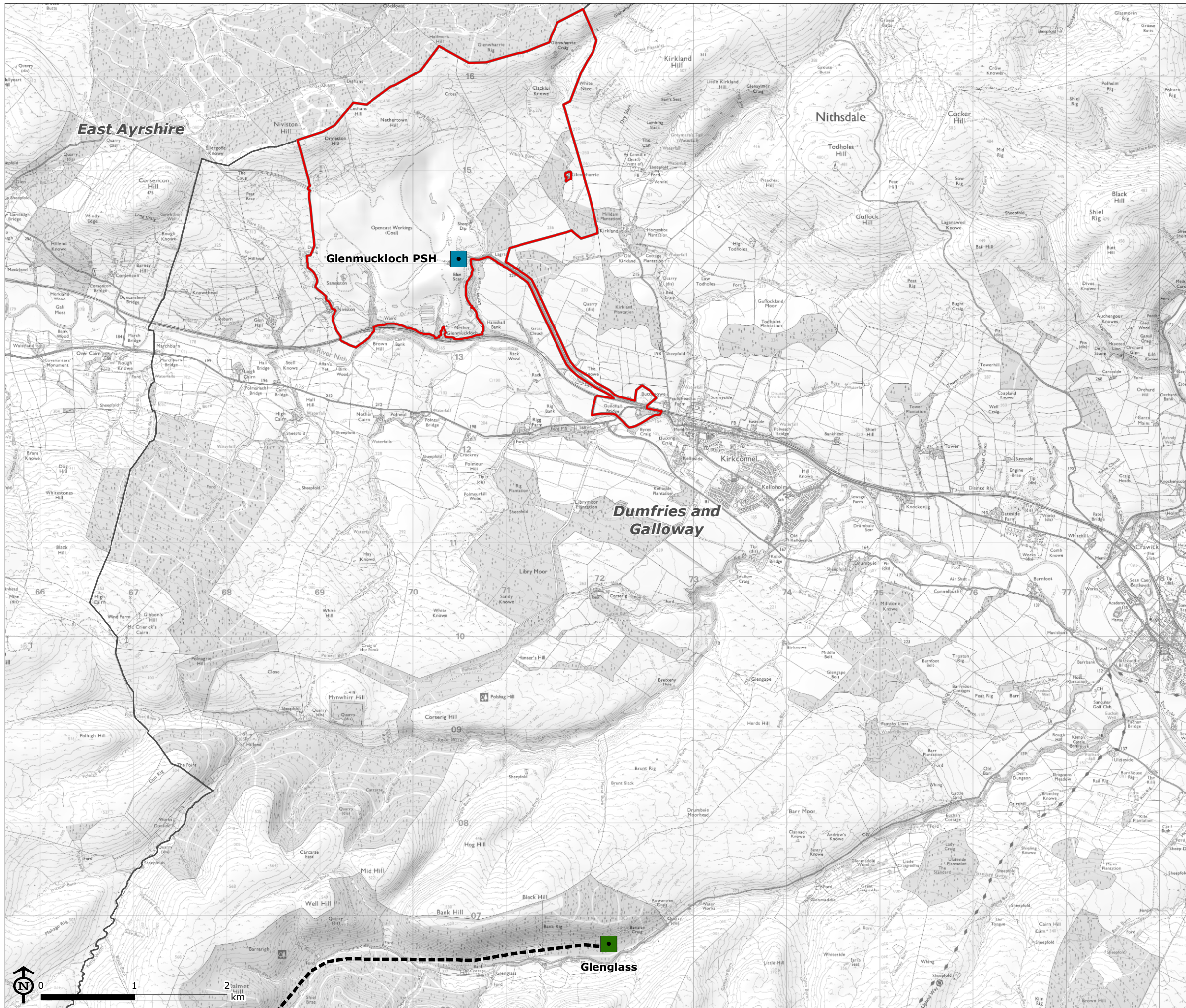
- 1.22 The remainder of this report is structured as follows:
- **Chapter 2** provides a description of the Project, including outline construction and maintenance information.
 - **Chapter 3** provides a description of the approach to scoping and the subsequent EIA.
 - **Chapter 4** details the relevant national and local planning policy relevant to the application and its determination for consent.
 - **Chapters 5 – 11** provides an overview of the environmental baseline and describes the specialist environmental studies that are proposed to assess the potential effects of the Glenmuckloch to Glenglass Reinforcement Project on the environment.
 - **Chapter 12** identifies the environmental topics to be scoped out of the EIA.
- 1.23 The following Appendices are also provided:
- Appendix 1: Proposed Structure of the EIA Report
 - Appendix 2: List of Consultees

The Glenmuckloch to Glenglass Reinforcement Project

EIA Scoping Report

Figure 1.1: Existing Network and Point of Connection

- Glenmuckloch Pumped-Storage Hydro Substation (PSH)
- Existing Glenglass Substation
- Glenmuckloch Pumped-Storage Hydro Scheme Site Boundary
- Existing 132kV Overhead Line South West Scotland (SWS) Project
- Local Authority Boundary



Map Scale: 1:40,000 @ A3



2 Project Description

The Proposed Route

- 2.1 SPEN are proposing to construct a new 132kV OHL grid connection approximately 10km in length, which is required to reinforce the network between the air insulated substation adjacent to the Glenmuckloch Wind Farm and Pumped Storage Hydro projects to the existing grid network via the 132kV substation at Glenglass. The proposed OHL will be supported on a steel tower design (L7 type).
- 2.2 As illustrated on **Figure 2.1** the OHL route, heads initially east from the Glenmuckloch PSH before turning broadly south east, passing to the south west of the proposed Glenmuckloch WF substation before running across improved pasture. The OHL route then crosses the River Nith valley and climbs south west, crossing the railway line to the west of farmstead at The Knowe, before crossing the A76 further south to the west of Rigg Farm. It then runs south east, below the slope at Sandy Knowe where the consented Sandy Knowe WF turbines would be located, before passing into the forestry plantation at Libry Moor.
- 2.3 From Libry Moor, the route options pass through an area of plantation woodland west and south of Corserig Farm to cross the Kello Water in an area where its containing valley is less incised. The route options then run parallel to contours across Drumbuie Moorhead and follow the line of a recently constructed Whiteside Hill and SWS Project access track to the Glenglass substation.
- 2.4 Much of the area surrounding the OHL route is rural in nature, comprising primarily of minerals (coal), agricultural and forested areas outside of the main settlements of Kirkconnel, Kelloholm and Sanquhar, where the population is dispersed, comprising individual and small clusters of farmsteads and residential properties.
- 2.5 The landscape is largely defined by the valley of the River Nith and the adjacent Southern Uplands, highlighted by the notable range in elevation across the OHL route. The ground level of the valley floor is approximately 140m AOD while the hill summits above include Bank Hill, at 530m AOD. The valley floor is characterised by medium scale agricultural land holdings and existing infrastructure, including the railway and A76.
- 2.6 On the valley slopes and undulating areas there are several areas of coniferous plantation, often rectilinear in form. There are also smaller areas of mixed and deciduous woodland, often associated with farmsteads and narrow stretches alongside the River Nith and smaller watercourses positioned in the incised tributary valleys. Above the valley floor and lower slopes, land use gives way to rough grazing and managed moorland mixed with plantation. Several of the hilltops and ridges have been developed for wind energy production, including Hare Hill Wind Farm, Sanquhar Community Wind Farm and Whiteside Hill Wind Farm.

Overview of Glenmuckloch to Glenglass Reinforcement Project Components

- 2.7 A new 132kV double circuit overhead line is required between the air insulated substation on the site of the Glenmuckloch Wind Farm and Pumped Storage Hydro and the existing Glenglass Substation to reinforce the network to accommodate several connection requirements as a result of renewable energy development in the Sanquhar area. The overhead line will be supported on L7 steel lattice towers as shown on **Figure 2.2**.
- 2.8 With an overhead line, conductors (or wires) are suspended at a specified height above ground and supported by lattice steel towers, spaced at intervals. Conductors can be made either of aluminium or steel strands. Most overhead lines at 132kV and above carry two 3-phase circuits,

with one circuit strung on each side of a tower. An earth wire may be required to provide lightning protection.

- 2.9 Conductors are strung from insulators attached to the lower cross-arms and prevent the electric current from crossing to the tower body.

Overhead Line Infrastructure

Steel Tower

- 2.1 Towers can be used to carry conductors at 132kV and above. These are generally of a lattice steel construction fabricated from high tensile steel which is assembled using galvanised high tensile steel bolts with nuts and locking devices.
- 2.2 There are three types of tower:
- Suspension or Line: where the tower is part of a straight-line section;
 - Tension or Angle: where there is a horizontal or vertical deviation in line direction of a specified number of degrees. There are three main types of angle tower 30 degrees, 60 degrees and 90 degrees; and
 - Terminal: where the overhead line terminates into a substation or on to an underground cable section via a separate cable sealing end compound or platform.

Tower Heights and Span Lengths

- 2.3 The overhead line will be supported on L7 lattice steel towers, which have six cross-arms (three on each side) and the L7 has a standard design height of 27m. A photo/graphic showing an existing L7 tower in the landscape is provided as **Figure 2.2**.
- 2.4 The section of overhead line between towers is known as the 'span', with the distance between them known as the 'span length'. Span lengths between towers average between 250m and 350m but can be increased if there is a requirement to span something such as a river or a loch.
- 2.5 Towers are used to regulate the statutory clearances required for conductor height, which is determined by the voltage of the overhead line (the higher the voltage, the greater the safety clearance that will be required) and the span length required between towers.

Tower Colour

- 2.6 Towers are fabricated from galvanised steel. It is not possible to colour towers to camouflage them for all times of day or all seasons. However, the colour of towers can only be recognised from a short distance. Beyond this distance, the colour is not distinguishable and 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. Towers will turn a dull grey colour after about 18 months.

Construction Process and Maintenance

- 2.7 The construction of OHLs requires additional temporary infrastructure such as temporary accesses to tower locations.

Steel Tower Construction

- 2.8 The construction of the OHL will follow a well-established sequence of activities as outlined below:
- 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.

Access

- 2.9 Prior to constructing the overhead line, 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 overhead line, all equipment and temporary access of construction areas will be removed with the land being reinstated to the satisfaction of the landowner.

Temporary Working

- 2.10 Temporary working areas will be required for the duration of construction works. Temporary vehicular access is required to every tower location. Steel tower locations will have a working area of approximately 50m x 50m. In some cases, the shape or size of the working area will be determined by nearby environmental or land use constraints, identified during the EIA process/prior to construction. Following the completion of the construction works, the temporary working area will be reinstated and restored to former conditions.

Construction Timescales

- 2.11 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 line or ground conditions prevent normal progress.

Operation and Maintenance

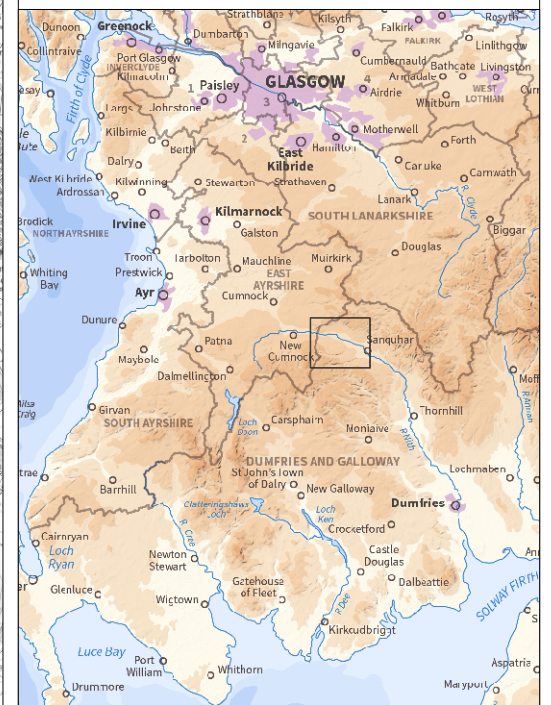
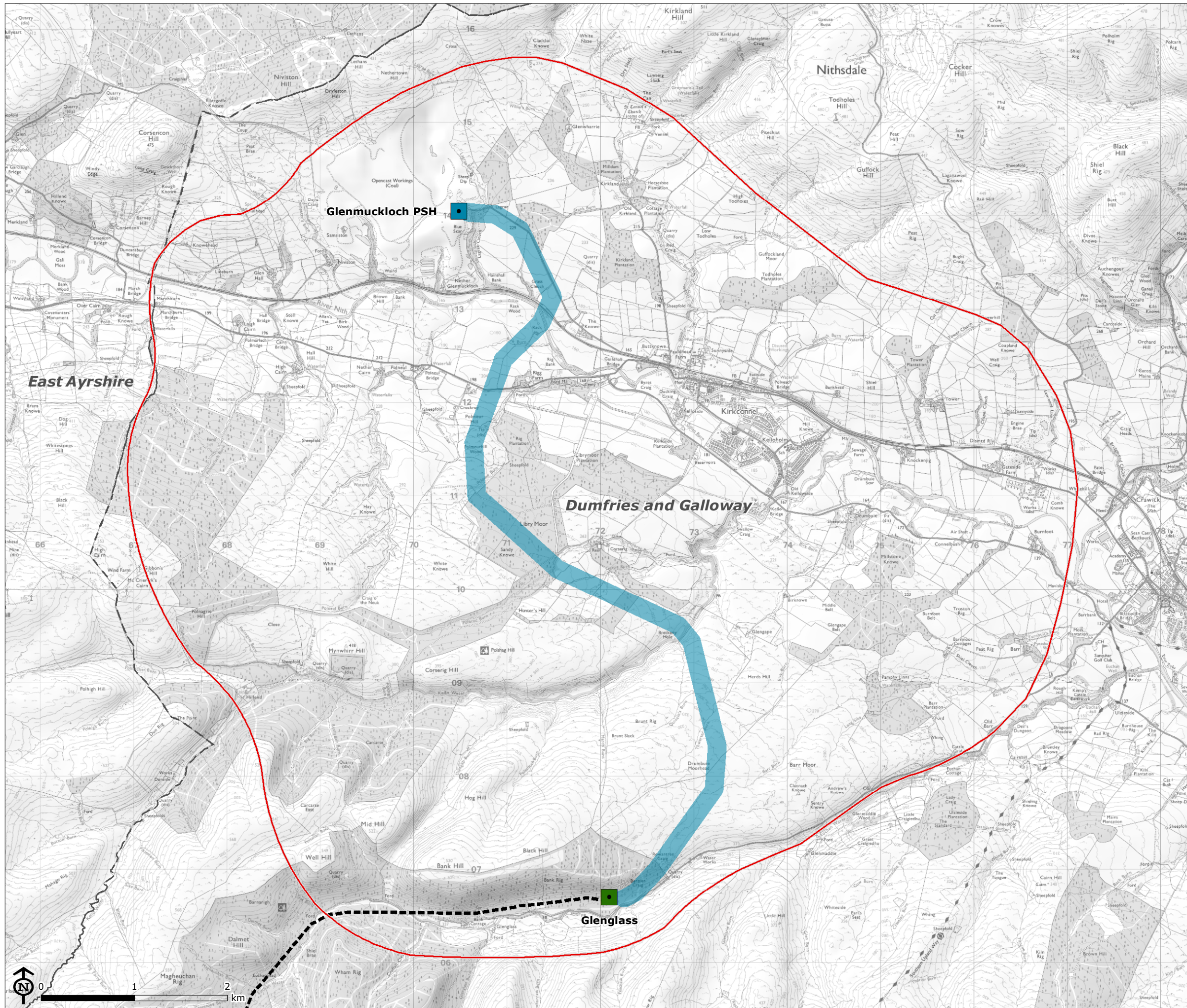
- 2.12 The majority of overhead line components are maintenance free, although periodic painting of the tower steelwork may be required, and components are regularly inspected for corrosion, wear and deterioration. There is also an ongoing requirement to ensure that any trees within the wayleave corridor do not impact on safety clearances.
- 2.13 The condition of tower steelwork and foundations is monitored regularly. Towers which have deteriorated significantly may be dismantled carefully and replaced.

The Glenmuckloch to Glenglass Reinforcement Project

EIA Scoping Report

Figure 2.1: The Proposed Route

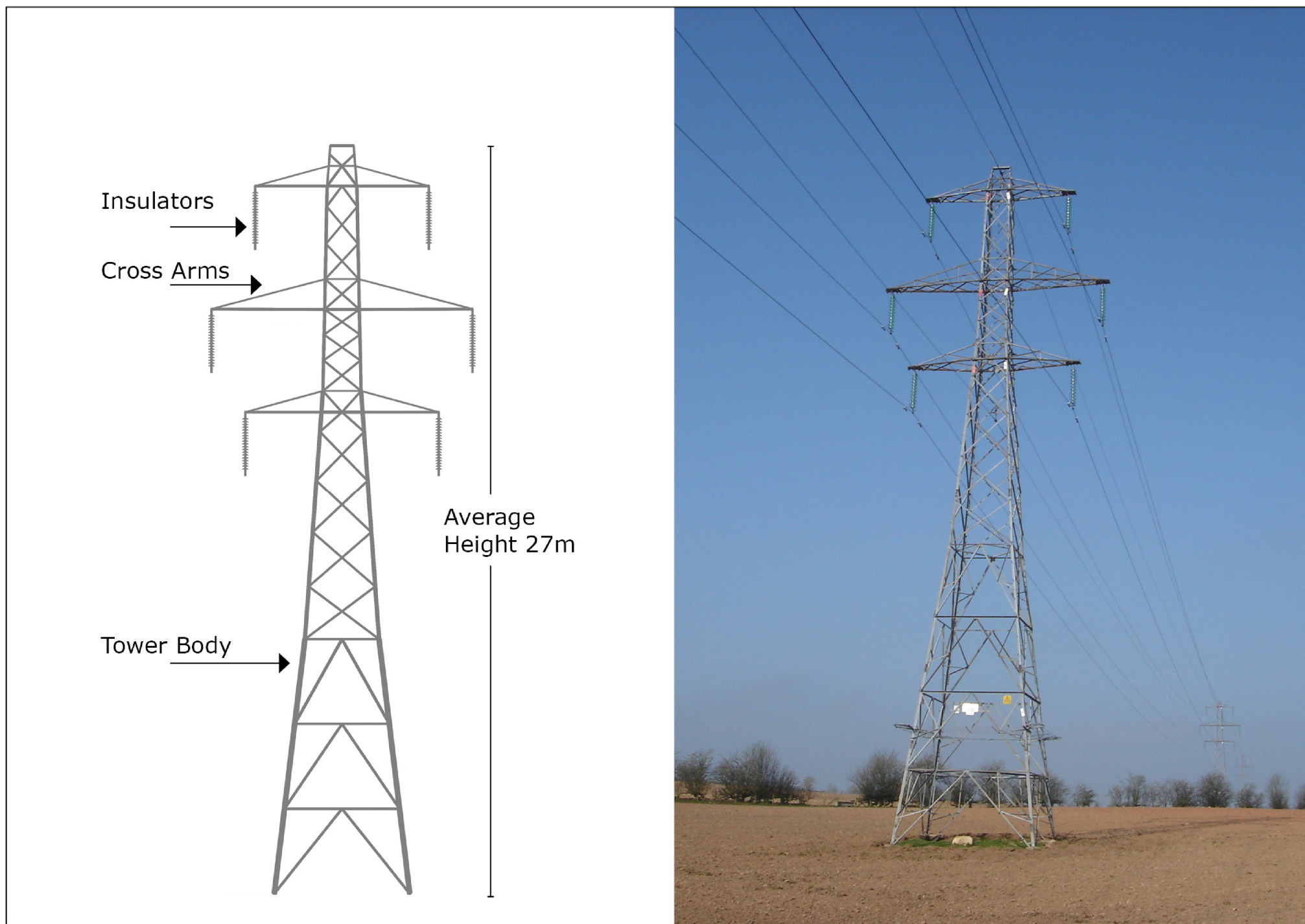
- Glenmuckloch Pumped-Storage Hydro Substation (PSH)
- Existing Glenglass Substation
- Routing Study Area
- Existing 132kV Overhead Line South West Scotland (SWS) Project
- Local Authority Boundary
- Proposed Route**
- 132kV Proposed Route



Map Scale: 1:40,000 @ A3



Figure 2.2: Typical Steel Tower
L7 Type



Component parts of 132kV Steel Lattice Tower L7

3 The Environmental Impact Assessment

Introduction

- 3.1 EIA is the process of systematically compiling, evaluating and presenting all the likely significant environmental effects, both positive and negative, of a proposed development, to assist the determining authority/authorities in considering the application for development consent, and reaching an informed decision. It enables the significance of these effects, and the scope for reducing negative, or enhancing positive, effects to be clearly understood by the determining authority, as well as those consulted as part of the EIA process. The information compiled during the EIA is presented within an Environmental Impact Assessment Report (EIA Report) to accompany the application. The proposed structure of the EIA Report is provided in **Appendix 1**.
- 3.2 EIA is an iterative process and runs in tandem with project design. As potential effects are identified, the design of the development, for example the positioning of the steel towers, will be adjusted to reduce or avoid adverse effects where possible and mitigation measures will be proposed as appropriate.
- 3.3 The EIA will be conducted in accordance with current government regulations, policy and guidance, with more detail provided on these in **Chapter 4**.
- 3.4 The following sections outline how the EIA process will be undertaken.

Scoping

- 3.5 The purpose of Scoping is to help focus the EIA on assessing the likely significant environmental effects of relevance to the Glenmuckloch to Glenglass Reinforcement Project.
- 3.6 Therefore, on the basis of the work undertaken to date as part of the routeing and consultation stage, feedback received in response to the routeing and consultation report, the professional judgement of the assessment team, experience from other similar projects, as well as policy, guidance and standards of relevance, each topic-based section within this report outlines the potentially significant effects associated with the construction and/or operation of the Glenmuckloch to Glenglass Reinforcement Project, proposed for detailed consideration within the EIA.
- 3.7 Effects considered likely to be insignificant, and which can be 'scoped out' and given only brief treatment unless further investigation suggests otherwise, are presented in **Chapter 12**.
- 3.8 Additional objectives of the Scoping Report are:
 - to establish the availability of baseline environmental data;
 - to define a survey and assessment framework from which a comprehensive overall assessment can be produced;
 - to invite consultees to identify any specific concerns that they might have in relation to the scheme;
 - to comment on the proposed methodology;
 - to provide and receive information relevant to the scheme;
 - to consider the way in which the findings are presented in the EIA Report; and
 - to understand and consider any procedural changes relevant to the submission of the EIA Report.

- 3.9 A list of consultees who will be approached by the ECU as part of the scoping consultation process, and/or contacted by individual specialists from the Glenmuckloch to Glenglass Reinforcement Project team to inform the EIA, is provided as **Appendix 2**. The list has been informed through discussion with the ECU. Additional suggestions of stakeholders who may have an interest in the development, and who may wish to be consulted for information to inform the EIA are invited as part of the scoping consultation process.

Baseline Conditions

- 3.10 The EIA Regulations require that the aspects of the environment, which are likely to be significantly affected by the development, be defined within the EIA Report. To achieve this, it will be necessary for each of the topic specialists to gather information on the environment, as it currently exists, i.e. 'baseline conditions'. This will be undertaken as the first step in the assembly of data for the EIA Report through a combination of consultation with relevant stakeholders, field survey work and desk based research.

Assessment of Effects (Including Cumulative Effects)

- 3.11 The assessment of the likely significant effects, using a range of appropriate methodologies, will take into account the construction and operation of the Glenmuckloch to Glenglass Reinforcement Project in relation to the study area and its environs.
- 3.12 The baseline, will include other similar developments i.e. infrastructure projects which are at the following stages in the development process:
- operational;
 - under construction; and
 - consented.
- 3.13 In addition, an assessment will be made of the likely significant cumulative effects of the development in combination with other infrastructure developments including:
- developments which are the subject of applications for consent and which have been submitted to the relevant determining authorities but not yet determined (or are the subject of a valid appeal);
 - any other developments deemed relevant by the ECU and/or Dumfries and Galloway Council.
- 3.14 The study area for each discipline will be defined separately to reflect the potential extent of likely significant effects associated with the Glenmuckloch to Glenglass Reinforcement Project. The study area for each discipline is not necessarily defined by the site boundary, with some survey areas being smaller and some larger depending on the nature of effects and taking into account advice and best practice. Therefore, study areas will be defined separately for each topic assessed in the EIA to reflect the likely extent of potential effects. For example, with an overhead line development, predicted effects associated with operational noise extend over a more localised area than visual effects.
- 3.15 In the interests of producing a focussed and concise report, which highlights clearly those issues of particular relevance to the Glenmuckloch to Glenglass Reinforcement Project, the specialist topic area assessment methodologies are not presented in detail within this report as these are now generally well established and widely understood. Current guidance, standards and legislation will be adhered to in all specialist assessments.

Mitigation

- 3.16 The most effective form of avoiding and/or mitigating potentially significant environmental effects associated with overhead lines is through careful routeing, as has been undertaken for the Glenmuckloch to Glenglass Reinforcement Project during the routeing and consultation process.
- 3.17 Subsequent to the routeing process and informed by the emerging findings of the EIA, the detailed design process and programming of construction activities provides another opportunity to further mitigate potentially significant effects. Given the prior experience of SPEN in implementing accepted good practice during the construction and operation of schemes such as this, and within the current regulatory context, such mitigation measures are considered to be embedded as part of the design/construction process. Embedded mitigation measures are considered as effective mitigation and will be taken into account prior to the assessment of the likely effects of the development.
- 3.18 Further tailored mitigation measures will then be proposed prior to determining the likely significance of residual effects in accordance with Part 1(4) of Schedule 4 of the EIA Regulations, which notes that the EIA Report should include "*a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.*" These measures will be termed mitigation measures and will be included for each topic area, where appropriate.
- 3.19 The EIA Report will identify and assess potentially significant effects prior to mitigation and, where mitigation measures are proposed, their likely effectiveness will be examined and the significance of the 'residual' effect then assessed. SPEN will be committed to implementing all the mitigation measures identified in the EIA Report and where appropriate, the mitigation measures implemented will be monitored for effectiveness.
- 3.20 Where there are opportunities for offsetting and/or positively enhancing effects, these will be identified through the EIA process.

4 Planning Policy Context

Introduction

- 4.1 This section presents a hierarchical overview of the legislative energy and planning policy context for the Glenmuckloch to Glenglass Reinforcement Project. A more detailed review of relevant policies will be included in a chapter within the EIA Report.
- 4.2 The chapter will not, however, assess whether the Glenmuckloch to Glenglass Reinforcement Project will comply with the identified policies, or the weight to be given to the relevant material considerations.
- 4.3 The Glenmuckloch to Glenglass Reinforcement Project is located within the Dumfries and Galloway Council area. As outlined in **Chapter 1**, the application will be determined by Scottish Ministers under Section 37 of the Electricity Act 1989. Dumfries and Galloway Council will, however, be a statutory consultee for the application. SPEN will also apply for deemed planning permission for the overhead line and associated works under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997.
- 4.4 An overview of the relevant planning policy and guidance, from a strategic to local level, which will be considered as part of the EIA process, is provided below.

National Planning Policy

National Planning Framework 3

- 4.5 The Third National Planning Framework (NPF3)⁴, which was laid in the Scottish Parliament on 23rd June 2014, is the spatial expression of the Scottish Government's Economic Strategy and plans for infrastructure investment and development priorities over the next 20 to 30 years. NPF3 strengthens the link between strategy and delivery through 14 national development priorities identified within Annex A. In relation to development priority number four of Annex A, "*An Enhanced High Voltage Electricity Network*", the statement of need is as follows: "*These classes of development are needed to support the delivery of an enhanced high voltage electricity transmission grid which is vital in meeting national targets for electricity generation, statutory climate change targets, and security of energy supplies.*" In terms of the description of Classes of development it includes new or upgraded onshore electricity cabling of or in excess of 132kV. On this basis, the OHL forming the Glenmuckloch to Glenglass Reinforcement Project constitutes national development.

Scottish Planning Policy (SPP)

- 4.6 Scottish Planning Policy (SPP)⁵ was updated in June 2014 along with NPF3 and is a statement of Scottish Government policy on land use planning. It emphasises the merits of sustainable development and the need to deliver heat and electricity in a low carbon manner through supportive policies in Development Plans.
- 4.7 For example, paragraph 156 of SPP states that strategic development plans should support national priorities for the construction or improvement of strategic energy infrastructure, including generation, storage, transmission and distribution networks, addressing cross-boundary issues, promoting an approach to electricity and heat that supports the transition to a low carbon economy.

⁴ The National Planning Framework (2014) available [online] at: <<http://www.gov.scot/Publications/2014/06/3539>>

⁵ The Scottish Government, (2014), 'Scottish Planning Policy', available [online] at: <http://www.gov.scot/Resource/0045/00453827.pdf>. Last accessed 13/03/2017.

- 4.8 SPP and NPF3 are material considerations when determining applications such as for the Glenmuckloch to Glenglass Reinforcement Project.

Planning Advice Notes (PANs)

- 4.9 Planning Advice Notes (PANs) and Specific Advice Sheets set out detailed advice from the Scottish Government in relation to a number of planning issues. Relevant PANs and Specific Advice Sheets, not being statements of policy, are referenced in the topic chapters and include the following:
- PAN 1/2013 Environmental Impact Assessment (as updated in 2017);
 - PAN 60 Planning for Natural Heritage 2000 (amended 2008);
 - PAN 68 Design Statements (2003);
 - PAN 75 Planning for Transport (2005);
 - PAN 79 Water and Drainage (2006);
 - PAN 3/10 Community Engagement (2010);
 - PAN 1/2011 Planning and Noise and accompanying Technical Advice Note (2013);
 - PAN 2/2011 Planning and Archaeology (2011).

Local Planning Policy

- 4.10 As the entirety of the Glenmuckloch to Glenglass Reinforcement Project is situated within the Dumfries and Galloway Council (D&GC) administrative area, the relevant Development Plan for the site comprises the recently adopted D&GC Local Development Plan 2 (LDP2) (October 2019). The Dumfries and Galloway LDP2 sets a spatial strategy in which to guide the future use and development of land in towns, villages and the rural area. It also provides a snapshot of where development should happen and where it should not. The LDP2 sets out this strategy through planning policies, which outline the criteria by which acceptability of development proposals will be considered.
- 4.11 The policies are structured around the themes of economic development, housing, historic environment, natural environment, community services and facilities, infrastructure and transport. The LDP2 recognises the importance of delivering supporting infrastructure and that provision of infrastructure is fundamental to the deliverability of development proposals and ensuring that infrastructure and service improvement requirements can be met.
- 4.12 The LDP2 is guided by the overarching principle that all development should support sustainable development, including the reduction of carbon and other greenhouse gas emissions. Of the broad principles to be incorporated into all development outlined within the Plan, those of relevance to the Glenmuckloch to Glenglass Reinforcement Project are:
- *"the provision of efficient and effective energy management solutions, having regard to energy demands of the area and the sources of renewable energy generation available;*
 - *"use of sustainable construction techniques;*
 - *"a SuDS scheme";*
 - *maximise the use of existing infrastructure;*
 - *enhance the environment of, and protect access to, open space, green networks and recreational opportunities; and*
 - *consider future proofing development to accommodate any future changing requirements such as waste management regimes, technological advancement in telecommunications infrastructure etc."*
- 4.13 As well as the overarching 20-year vision, the Plan sets out further aspects of the wider vision for achieving a viable rural economy and community; vibrant towns and villages; and a consolidated successful Regional Capital in Dumfries. Key elements of the Dumfries and Galloway Council's overall 20-year vision for the region are set out below:

- *"a thriving region with a sustainable economy built on sustainable principles that safeguard the landscape, natural and historic environment, promote growth, maximising the use of existing infrastructure and enhance connectivity;*
- *have maximised its location to attract investment to create employment and investment opportunities which will in turn attract people of working age to the region;*
- *towns across the region will occupy niche positions making the most of their geographical locations; and*
- *opportunities in the rural area for economic development, housing and recreation."*

4.14 Transposing the vision to a spatial context, the Plan outlines its Spatial Strategy with the aim of situating the right type of development in the right place and meeting the needs of the community, whilst promoting a more sustainable pattern of development, creating opportunities for sustainable economic growth, reducing carbon emissions, and minimising the need to travel. The Spatial strategy is set out under seven distinct headings, namely: the Economic Strategy, Business and Industry Land Requirement (2017-2037), Energy Strategy, Retail Strategy, Housing Strategy, Transport Strategy, Active Travel and Green Networks and Waste Management Strategy.

4.15 LDP2 includes a new energy strategy, outlining the Council's commitment to the development of a Regional Energy Strategy to reflect the Climate Change Bill and the decarbonisation of nation energy through:

"a combination of energy efficiency measures and changes of energy supplies from fossil fuels to those generated by renewable sources and low carbon supplies such as hydrogen, biomass, bioethanol or methane gas." (LDP2, para 3.20)

4.16 The Energy Strategy further notes that:

"National Planning Framework 3 identifies a need for an enhanced high voltage energy transmission network to facilitate renewable electricity development and its export, including improvements to the network that lies in Dumfries and Galloway. Significant investment in the network is anticipated during the plan period, which the council supports in principle in appropriate locations. Proposals will be assessed against the provisions of policies OP1⁶ AND IN1⁷" (LDP2, para 3.22)

4.17 As the S37 application for the Glenmuckloch to Glenglass Reinforcement Project is expected to be submitted in 2020/2021, LDP2 is considered to form material consideration to the proposed development.

⁶ OP1 - Development Considerations

⁷ IN1 - Renewable Energy

5 Landscape and Visual Amenity

Introduction

- 5.1 This chapter sets out the proposed approach to the assessment of the potentially significant effects of the Glenmuckloch to Glenglass Reinforcement Project on landscape and visual amenity (including the visual amenity of residents), including a consideration of the implications for designated landscapes, and cumulative effects.
- 5.2 During the routeing stage a desk-based review of existing information was undertaken, including Ordnance Survey (OS) maps, the relevant Local Development Plan, and the Dumfries and Galloway Landscape Character Assessment. This was supplemented by field work and further informed by feedback received from stakeholders, including Dumfries and Galloway Council, SNH and the public.

Existing Conditions

- 5.3 In broad terms, the landscape of the study area for the proposed OHL is defined by the River Nith valley and adjacent Southern Uplands; much of it is rural in nature, comprising primarily of agricultural and forested areas outside of the main settlements of Kirkconnel and Sanquhar.
- 5.4 The ground level of the valley floor is approximately 140m AOD while the hill summits above include Bank Hill, at 530m AOD, and so there is a notable range in elevation across the study area. The uplands are generally formed of rounded hills or undulating ridgelines and they feature several incised valleys which drain towards, and feed into, the Nith.
- 5.5 The relatively broad valley is a recognised transport corridor for the area and is passed through by the A76 road, between Kilmarnock and Dumfries, and the Glasgow South Western Line railway, between Glasgow and Carlisle via Kilmarnock and Dumfries. The main settlement within the study area is Kirkconnel and Kelloholm, with Sanquhar located on the eastern edge of the study area. Outwith these settlements, there are individual dwellings, farmsteads and small clusters of residential properties dispersed across the study area.
- 5.6 Above the valley floor and lower slopes, land use gives way to rough grazing and managed moorland mixed with plantation. Several of the hilltops and ridges have been developed for wind energy production, including Hare Hill Wind Farm, Sanquhar Community Wind Farm and Whiteside Hill Wind Farm.
- 5.7 There are a number of core paths connecting Kirkconnel with the uplands to the north and south. There is also a section of the Southern Upland Way within the study area, providing access from the valley floor at Sanquhar to Polskeoch Burn (approximately 350m AOD) in the south of the study area.

Designated Landscapes

- 5.8 There are no national landscape designations in the Glenmuckloch to Glenglass Reinforcement Project 5km study area.
- 5.9 Part of the East Ayrshire Sensitive Landscape Area (SLA) is within the western part of the study area. Part of the Thornhill Uplands Regional Scenic Area (RSA), a Dumfries and Galloway landscape designation, is within the south-western part of the study area. The proposed OHL route is not located within these locally designated landscapes.

Landscape Character

- 5.10 The Routeing and Consultation Report contains an appraisal of landscape susceptibility based on the following local Landscape Character Types (LCTs):
- River Nith Valley Floor: broad and meandering valley floor with relatively simple landform;
 - Undulating Midslope; gently sloping and undulating landform with a secluded and tranquil character;
 - Incised Tributary Valley: steep-sided with rough texture and native woodland;
 - Transitional Slope: landcover dominated by a mixture of rough grazing and blocks of coniferous forestry, relatively simple pattern and large in scale; and
 - Southern Uplands: open rounded hills with characteristic skylines, relatively tranquil and secluded.
- 5.11 These local LCTs were identified by LUC during the Routeing and Consultation process. Scottish Natural Heritage (SNH) has recently made available an updated dataset, via their website, of national landscape character assessments. As part of the Landscape and Visual Impact Assessment (LVIA), the local LCTs above and the SNH dataset will be reviewed, to determine an appropriate basis for the appraisal.
- 5.12 The LVIA will consider the potential for direct effects upon LCTs within which the OHL is proposed and for indirect effects upon LCTs in the study area from which there is potential visibility.
- 5.13 **Visual Amenity** Generally, there are relatively few visual receptors within the immediate vicinity of the Glenmuckloch to Glenglass Reinforcement Project. Visual receptors identified during the routeing process include the following:
- Residential receptors located within the settlement of Kirkconnel and Kelloholm and scattered residential properties and farmsteads located primarily along the valley floor and lower slopes;
 - Road users on the A76 and people travelling on the railway, which run broadly in parallel and cut through the central section of the study area; and
 - Recreational receptors on the Southern Upland Way and on Core Paths at Mynwhirr Hill, Libry Moor, and Kelloside Plantation.
- 5.14 The LVIA will consider the potential for effects upon these visual receptors.

Cumulative Developments

- 5.15 Other OHL connections sharing the same study area were appraised cumulatively during the routeing process to ensure that in combination the routes meet routeing objectives. SPEN's overall approach is the premise that the key effects of an overhead line which are best minimised through careful routeing are visual effects. OHL connections considered as cumulative developments within routeing and consultation included:
- The Glenmuckloch 33kV Connection Project⁸;
 - The Sanquhar II Wind Farm Connection Project; and
 - Sandy Knowe Wind Farm 132kV OHL⁹.
- 5.16 The LVIA will consider the potential for the Glenmuckloch to Glenglass Reinforcement Project, in combination with other developments within the study area, to result in cumulative effects upon landscape and visual receptors. Existing and consented wind energy developments will be considered as part of the landscape and visual baseline for the LVIA. The potential for undetermined wind energy development proposals, and those of other relevant vertical features, to result in cumulative effects upon landscape and visual receptors will also be considered.

⁸ SPEN, The Glenmuckloch 132kV Connection project, Routeing and Consultation Document (January 2019). Available[online] at: https://www.spenergynetworks.co.uk/pages/community_consultation.aspx

⁹ SPEN, Proposed 132kV Overhead Line Connection from Sandy Knowe Wind Farm to Glenglass Substation, Routeing and Consultation Document (May 2017). Available[online] at: https://www.spenergynetworks.co.uk/pages/community_consultation.aspx

Methodology

- 5.17 Informed by the type and scale of overhead line infrastructure proposed, a study area of 5km is proposed for the LVIA, as shown on **Figure 5.1**. An initial indicative bare ground Zone of Theoretical Visibility (ZTV) has been prepared for the Glenmuckloch to Glenglass Reinforcement Project, also shown on **Figure 5.1**. The extent of the study area has been informed by the ZTV and professional judgement and defined on the basis that at distances greater than 5km significant effects on landscape character and visual amenity are unlikely to occur.
- 5.18 The ZTV has been prepared based on the centre line position and minimum average spacing along the proposed route of the steel lattice towers (average span between 250m to 350m). The theoretical visibility of individual towers has been limited to a maximum distance of 10km, as beyond this distance the type and scale of towers proposed are likely to be imperceptible in most instances.
- 5.19 As shown on **Figure 5.1**, the ZTV suggests that the Glenmuckloch to Glenglass Reinforcement Project would be visible from the majority of the valley floor area and from containing slopes; however, because the ZTV is based on a bare ground model, it is likely that areas of mature plantation woodland, tree belts, buildings and other structures will limit this visibility. The ZTV also shows that hills and ridgelines to the north, south and west within the study area (e.g. Lethans Hill, Rough Naze and Hare Hill) will prevent visibility of the Glenmuckloch to Glenglass Reinforcement Project from areas beyond these topographic features.
- 5.20 Following the approach to the EIA set out in **Chapter 3**, the LVIA, Cumulative LVIA (CLVIA), and presentation of landscape and visual effects will be carried out in line with relevant legislation and standards, as well as the following guidelines, in so far as they are relevant to the Glenmuckloch to Glenglass Reinforcement Project:
- Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment - 3rd Edition (GLVIA3);
 - Scottish Natural Heritage (2012) Assessing the cumulative impact of onshore wind energy developments;
 - Landscape Institute (2011) Advice Note 01/11 Photography and photomontage in landscape and visual impact assessment;
 - Landscape Institute (2017) Technical Guidance Note 02/17 Visual representation of development proposals; and
 - Scottish Natural Heritage (2017) Visual Representation of Wind Farms - Version 2.2.
- 5.21 Landscape and visual assessments are distinct, but interconnected, processes and the assessment will describe potential landscape and visual effects separately. The LVIA will consider potential effects on:
- Landscape as a resource in its own right (caused by changes to the constituent elements of the landscape, its specific aesthetic or perceptual qualities and the character of the landscape); and
 - Views and visual amenity as experienced by people (caused by changes in the appearance of the landscape).
- 5.22 Judging the significance of landscape and visual effects requires consideration of the nature of the receptor and the nature of the effect on the receptor. GLVIA3 states that the nature of receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to the type of change proposed, and the value attached to the receptor. The nature of the effect on each receptor, commonly referred to as its magnitude, should be assessed in terms of size and scale; geographical extent; duration and reversibility. Judgements of sensitivity and magnitude are then combined to form a judgement regarding the overall significance of effect.
- 5.23 A detailed methodology for the LVIA and CLVIA has not been included within this Scoping Report but can be provided to consultees on request, however an overview of the key receptors and outline method in relation to visual amenity, sequential views and cumulative assessment are provided below to inform consultee responses to Scoping.

Visual Amenity

- 5.24 The initial ZTV shown on **Figure 5.1** illustrates the likely maximum extent of theoretical visibility across the study area. The ZTV, in conjunction with extensive fieldwork and feedback from stakeholders during the routeing process has been used to inform the selection of representative assessment viewpoints to be considered in the LVIA. Viewpoints have been identified to represent a range of receptors (people), distances and viewing experiences.
- 5.25 The proposed viewpoint locations are listed in **Table 5.1** below and are illustrated on **Figure 5.1**.

Table 5.1 Proposed Assessment Viewpoint Locations

VP Reference	Description	Grid Reference		Reasons for Selection
		Easting	Northing	
1	A76 near Crockroy	270515	612250	Represents sequential views for road users and residential properties close to the road.
2	Lagrae Road	271705	612880	Represents residential views from properties north-west of Kirkconnel.
3	A76 near Guildhall Bridge	272275	612440	Represents sequential views for road users.
4	Main Street, Kirkconnel	273680	612110	Represents views from the settlement of Kirkconnel.
5	Dryburn Road, Kelloholm	273500	611305	Represents views from residential properties on the southern edge of Kelloholm.
6	Libry Moor	271295	609975	Represents views from recreational users of the Core Path and views from properties south and south-east of Kirkconnel.
7	Southern Upland Way (SUW)	275015	605615	Representative of views for recreational visitors on the SUW.
8	A76 near Waistland	266015	613015	Represents sequential views for road users and residential properties close to the A76 road.
9	A76 near Gateside	276145	611290	Represents sequential views for road users and residential properties close to the A76 road.

- 5.26 The final assessment viewpoint locations will be confirmed following the detailed design of the route alignment and will be subject to micro-siting in the field to take account of the presence of screening. Each viewpoint will be visited and 360 degree photography will be captured at each, in accordance with guidance published by SNH¹⁰ and the Landscape Institute¹¹, to illustrate the existing characteristics of the view. These characteristics will be detailed in the baseline description, prior to undertaking the assessment of visual effects.
- 5.27 Each viewpoint will be presented with baseline photography and wireline visualisations. A selection of key viewpoints will be illustrated with photomontage visualisations to provide a photorealistic illustration of the change in views.

Residential Visual Amenity

- 5.28 It is not proposed to undertake a separate Residential Visual Amenity Assessment (RVAA) as part of the assessment. However, residential receptors will be included as part of the LVIA, informed by the viewpoints identified above, RVAA is a more detailed level of assessment considering individual properties and their curtilage. This is not considered to be required on the basis that the

¹⁰ SNH, Visual Representation of Wind Farms, Version 2.2 (February 2017). Available [online] at: <https://www.nature.scot/sites/default/files/2017-07/A2203860%20-%20Visual%20representation%20of%20wind%20farms%20-%20Guidance%20-%20Feb%202017.pdf>

¹¹ Landscape Institute, Advice on Photography and Photomontage, LI Advice Note 1/11 (March 2011). Available [online] at: <https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/01/LIPhotographyAdviceNote01-11.pdf>

routeing process sought to avoid potential effects on the views and visual amenity of residential receptors wherever possible. This was informed by observations made during fieldwork which considered the orientation of properties, the likely availability of views from the property and its curtilage and the presence of intervening screening (e.g. localised landform, woodland, forestry and vegetation, built form and other landscape features).

Cumulative Assessment

- 5.29 There is the potential for cumulative effects to arise within the study area from the addition of the overhead line components of the proposed Glenmuckloch to Glenglass Reinforcement Project alongside other developments which are either operational, under construction, consented or the subject of a valid application for consent (proposed).
- 5.30 Existing developments, such as wind farms and other vertical infrastructure (e.g. overhead lines and telecommunications masts) form part of the existing baseline environment and will be considered in the LVIA. The CLVIA will also consider the likelihood for significant cumulative landscape and/or visual effects with other types of development, however, developments will be limited to those which are likely to result in a similar type, scale and extent of landscape and visual effects as the Glenmuckloch to Glenglass Reinforcement Project. SPEN will seek to agree a list of developments to be considered in the CLVIA with consultees through the EIA process.

Likely Significant Effects

- 5.31 Adopting a precautionary approach, at this preliminary stage, potential landscape and visual effects associated with the construction and/or operation of the Glenmuckloch to Glenglass Reinforcement Project include:

Landscape Effects

- effects during construction on existing landscape character, landscape features and land cover, and;
- effects during operation on landscape character.

Visual Effects

- effects on the views and visual amenity of receptors (people);
- effects on views experienced by road users within the study area, and in close proximity to the Glenmuckloch to Glenglass Reinforcement Project including the A76 and the Glasgow South Western line railway;
- effects on views experienced by recreational receptors on the Southern Upland Way and on the Core Path at Libry Moor; and
- cumulative visual effects associated with the Glenmuckloch to Glenglass Reinforcement Project seen in combined, successive or sequential views with other existing or proposed developments.

Approach to Mitigation

- 5.32 The mitigation of potential landscape and visual effects has been approached through the routeing of the proposed route.
- 5.33 The LVIA will inform further modifications and refinements to the detailed design of the Glenmuckloch to Glenglass Reinforcement Project, including consideration of individual steel tower locations during the design and assessment process, and the identification of any further appropriate mitigation measures to reduce potential residual effects.
- 5.34 The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with National Grid Company plc (NGC) 1992 and Scottish Hydro-Electric Transmission plc

(SHETL) 2003 Notes) will be used to inform the design process, to further minimise potential landscape and visual effects.

- 5.35 Notwithstanding the application of the principles outlined in the Holford Rules, given the intrinsic characteristics of overhead line infrastructure, some significant adverse landscape and visual effects may be predicted.

Q4.1: Are there additional sources of baseline information which should be referred to inform the LVIA and CLVIA?

Q4.2: Is the proposed methodology (including guidance, 5km study area, identification of receptors and approach to cumulative assessment) appropriate for the assessment of potentially significant landscape and visual effects?

Q4.3: Is the list of proposed representative assessment viewpoints appropriate to inform the visual assessment? If suggesting alternative locations, please provide details, including 12 figure grid reference and reasoning.

Q4.4: Are there specific developments which should be considered in the cumulative assessment?

The Glenmuckloch to Glenglass Reinforcement Project

EIA Scoping Report

Figure 5.1: Zone of Theoretical Visibility (ZTV) and Viewpoint Locations

- Glenmuckloch Pumped-Storage Hydro Substation (PSH)
- Existing Glenglass Substation
- 5km Study Area
- Existing 132kV Overhead Line South West Scotland (SWS) Project
- Proposed Route**
- 132kV Proposed Route
- Zone of Theoretical Visibility**
- Potential Visibility of Tower up to 10km Away
- Landscape and Visual Receptors**
- Southern Upland Way
- Core Path
- Proposed Viewpoint Locations**
- Viewpoint Locations

1. A76 near Crockroy
2. Lagrae Road
3. A76 near Guildhall Bridge
4. Main Street, Kirkconnel
5. Dryburn Road, Kelloholm
6. Libry Moor
7. Southern Upland Way (SUW)
8. A76 near Waistland
9. A76 near Gateside

Notes:
The ZTV is calculated to tower height of 27m from a viewing height of 2m above ground level. The tower positions used in the ZTV include the calculated angle tower locations, and estimated locations with 250m spacing in between the angle poles. Each tower assumes visibility to 10km.

The terrain model assumes bare ground and is derived from OS Terrain 5 height data obtained from Ordnance Survey in 2019.

Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcMap 10.5.1.

Map Scale: 1:70,000 @ A3

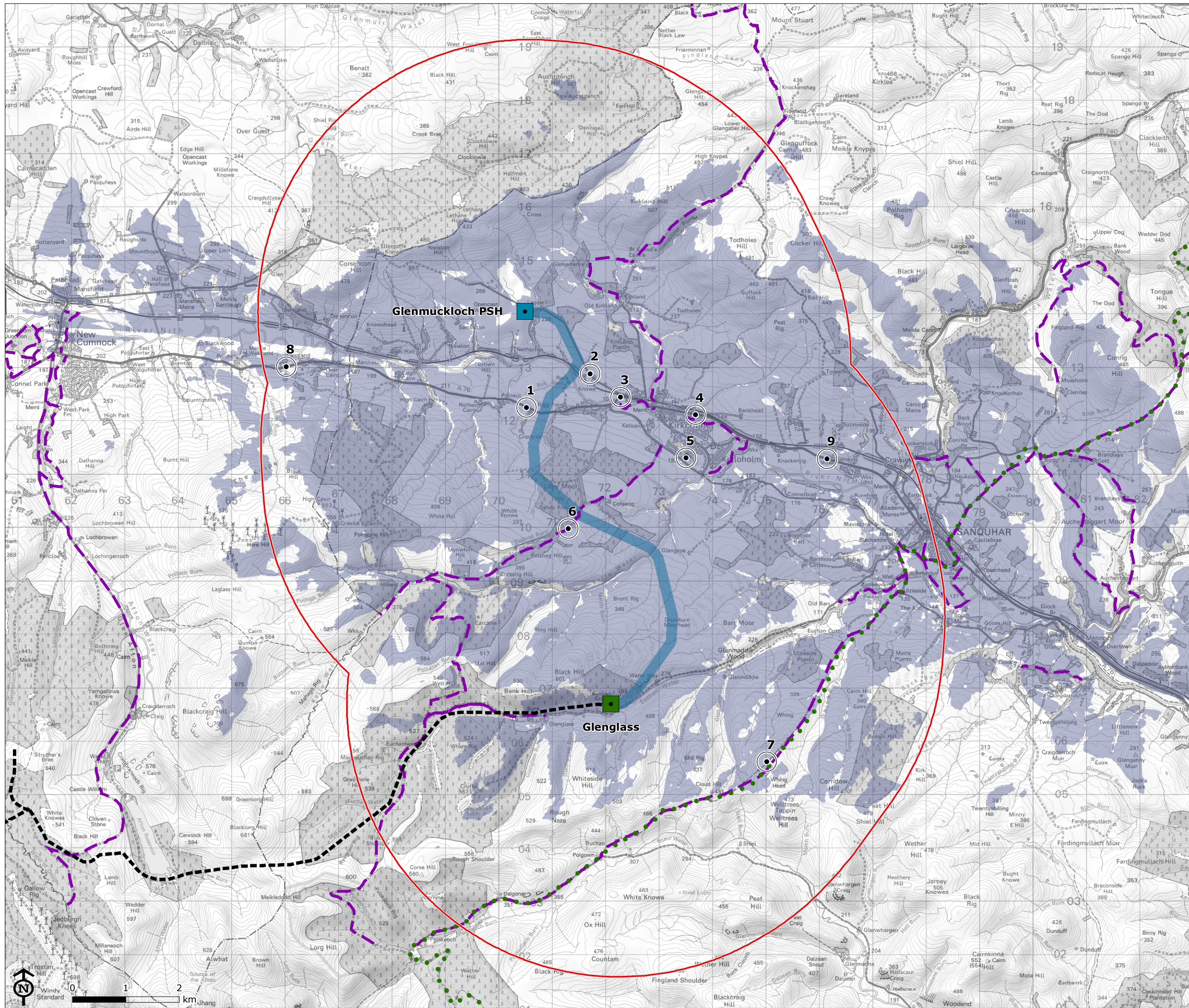






Figure 5.2: Local Landscape Character Types

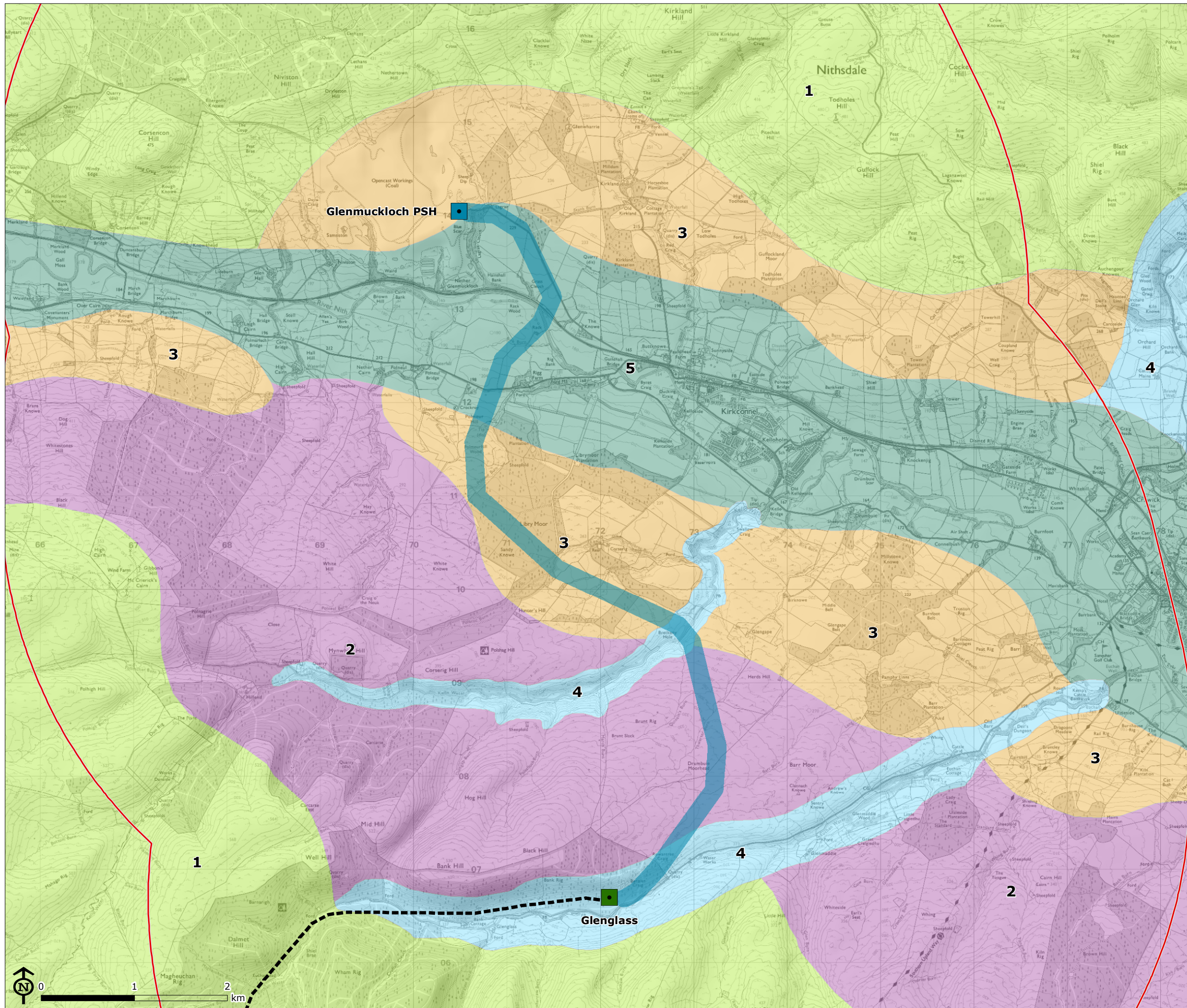
-  Glenmuckloch Pumped-Storage Hydro Substation (PSH)
-  Existing Glenglass Substation
-  5km Study Area
-  Existing 132kV Overhead Line South West Scotland (SWS) Project

Proposed Route

-  132kV Proposed Route

Local Landscape Character Types

-  1. Southern Uplands
-  2. Transitional Slope
-  3. Undulating Midslope
-  4. Incised Tributary Valley
-  5. River Nith Valley Floor

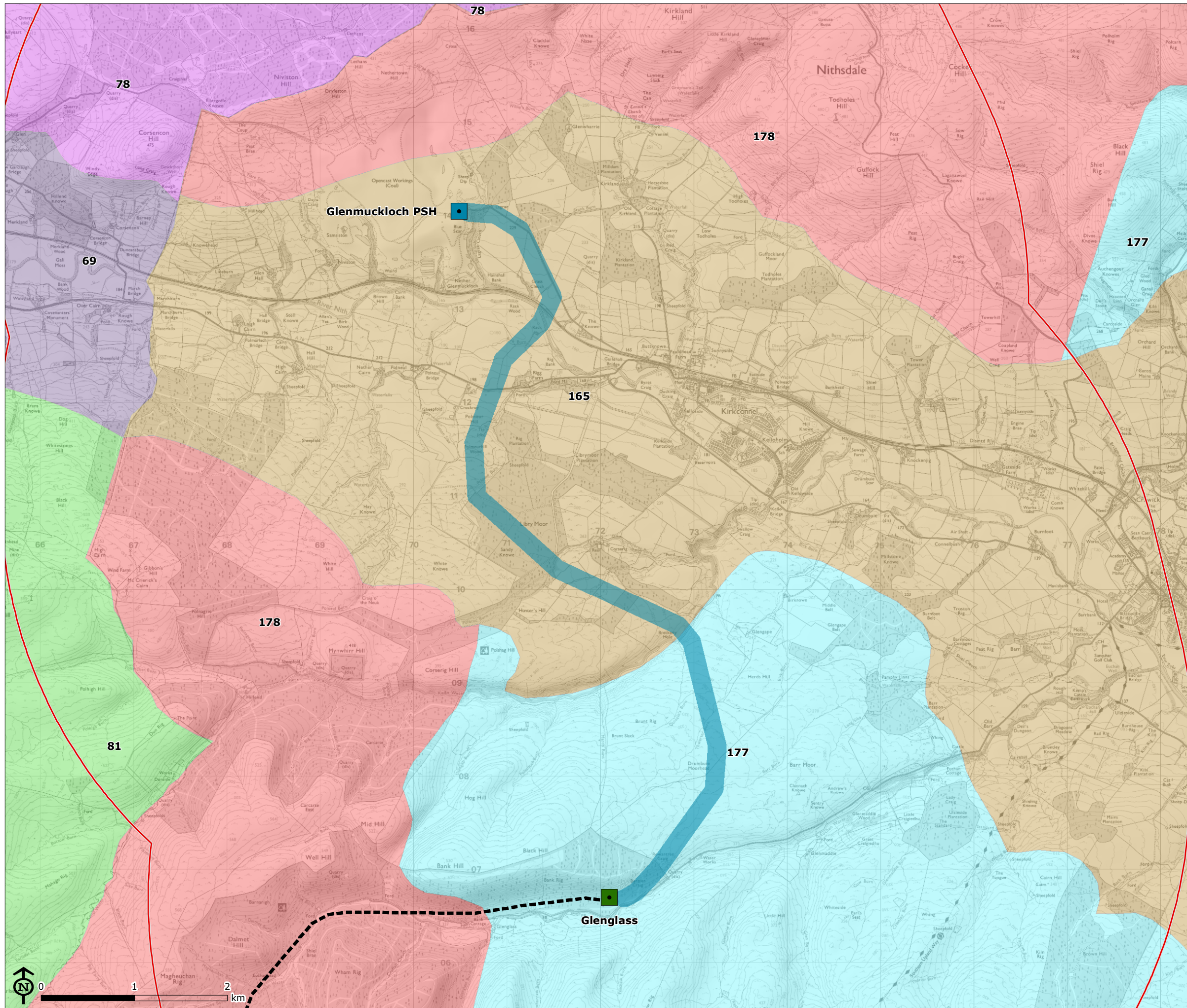


Map Scale: 1:40,000 @ A3



Figure 5.3: SNH National Landscape Character Types

- Glenmuckloch Pumped-Storage Hydro Substation (PSH)
- Existing Glenglass Substation
- 5km Study Area
- Existing 132kV Overhead Line South West Scotland (SWS) Project
- Proposed Route**
- 132kV Proposed Route
- 2019 SNH - Landscape Character Types**
- 69. Upland River Valleys - Ayrshire
- 78. Plateau Moorland - Ayrshire
- 81. Southern Uplands - Ayrshire
- 165. Upper Dale - Dumfries & Galloway
- 177. Southern Uplands - Dumfries & Galloway
- 178. Southern Uplands with Forest - Dumfries & Galloway



Map Scale: 1:40,000 @ A3



6 Hydrology, Geology, Hydrogeology and Water Resources

Introduction

- 6.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the construction and operation of the Glenmuckloch to Glenglass Reinforcement Project on hydrology, geology, hydrogeology and water resources. The assessment will be carried out in line with relevant legislation and standards.

Existing Conditions

- 6.2 A desk based review of 1:10,000 and 1:25,000 scale Ordnance Survey maps, 1:50,000 scale British Geological Survey (BGS) Geology maps, 1:250,000 scale Soils maps of Scotland and 1:250,000 SNH Carbon and Peatland 2016 Map has been undertaken to identify watercourses and ground conditions within the vicinity of the proposed route. See **Figure 6.1**.
- 6.3 The geology of the proposed route is mainly on sedimentary bedrock (Scottish Lower and Middle Coal Measures and Kirkcolm Formations) with a short section in the north located on an igneous intrusion. The northern section of the proposed route, leaving from the air insulated substation on the site of the Glenmuckloch Pumped Storage Hydro crosses a small section of coal extraction site (Glenmuckloch opencast coal) which is due to be restored as part of the PSH scheme.
- 6.4 The superficial geology of the proposed route comprises mainly glacial till and fluvio-glacial deposits, with some localised peat and alluvium deposits. The two areas of peat deposits along the proposed route are located around the summit of Polmeur Hill, to the east of Polmeur Burn, and on Barr Moor, south of the Barr Burn at the southern end of the route.
- 6.5 The SNH Carbon and Peatland mapping (2016) indicates that carbon-rich soils, deep peat and small areas of priority peatland habitat are likely to be present in localised areas. There is one small area of Class 1 priority peatland habitat located close to the Barr Burn along the proposed route, however this could be avoided during more detailed design and routeing alignment phases. There are no Class 2 priority peatland habitats mapped along the proposed route. There are extensive areas of Class 3 and Class 5 peat mapped on the upland areas from Polmeur Hill to Barr Moor on the southern part of the proposed route¹². A review of SEPA Flood Maps indicate that there are some areas identified to be at risk of flooding in a 1 in 200 year event within and close to the proposed route (e.g. the River Nith, Kello Water and Euchan Water). Avoidance of flood risk areas was a factor in the routeing process and crossing of floodplains has been minimised. Flood risk areas will be identified within in the baseline of the EIA.
- 6.6 The proposed route is located within the River Nith, Kello Water and Euchan Water catchments with the proposed route crossing several small tributaries such as the Lagrae Cleuch, Birk Burn, Polmeur Burn, Polbroc Burn, Guttie Burn, Quintins Burn, Thwarter Burn and Barr Burn as well as numerous other smaller watercourses. The Kello Water and Euchan Water are both tributaries of the River Nith.
- 6.7 SEPA has characterised surface water quality status under the terms of the Water Framework Directive. Classification by SEPA considers water quality, hydromorphology, biological elements including fish, plant life and invertebrates, and specific pollutants known to be problematic. The classification grades through High, Good, Moderate, Poor and Bad status. This provides a holistic

¹² Class 3 is not priority peatland habitat but is associated with wet and acidic soils where most soils are carbon-rich with some areas of deep peat. Class 5 is an area where there is no peatland habitat recorded but soils are carbon-rich and deep peat is present.

assessment of ecological health. Within the project area three watercourses are large enough to be classified:

- The River Nith (upstream of Sanquhar)(Waterbody ID 10611) was classified as 'Poor' in 2017;
- The River Nith (downstream of Sanquhar) (Waterbody ID 10610) was classified as 'Moderate' in 2017; and
- The Kello Water (Waterbody ID 10616) and the Euchar Water (Waterbody ID 10617) were both classified as 'Good' in 2017.

Methodology

- 6.8 In addition to the desk-based surveys undertaken to date, consultation with Dumfries & Galloway Council, Scottish Water and SEPA will be undertaken to obtain relevant flood information and water supply information, including abstractions and private water supplies (PWS). Relevant flow and water quality data will also be obtained from SEPA.
- 6.9 A walkover hydrological survey of the Glenmuckloch to Glenglass Reinforcement Project will be carried out to supplement the desk based work and data collection to identify the existing baseline conditions, including identifying and documenting watercourse crossings (proposed and existing), identification of other water features such as wetlands, springs and GWDTEs, undertaking an overview assessment of areas identified as floodplain within the SEPA Flood Maps and providing a general overview of landscape and land cover of importance to hydrology. Private water supply visits will also be undertaken following consultation with the private water supply owners to verify the source location. GWDTEs will be identified based on habitat mapping and ecology surveys (see Chapter 7 – Biodiversity)
- 6.10 The presence of small areas of SNH Class 1 within the southern section of the Glenmuckloch to Glenglass Reinforcement Project does not mean that carbon rich soils, deep peat and priority peatland habitat will be adversely affected. Peat depth surveys are proposed along the proposed route where peat deposits are shown on the geological, soil and SNH carbon and peatland mapping to delineate the spatial coverage and depth of peat within the study area.
- 6.11 The infrastructure components will be designed to avoid deeper peat and priority peatland habitats where possible.
- 6.12 Peat probing will be undertaken systematically along the length of the Glenmuckloch to Glenglass Reinforcement Project where peat is anticipated (approx. 5km based on the review of British Geological Survey Superficial Geology maps, Soils Scotland Mapping and SHN Carbon and Peatland Mapping). Where probing locates peat more extensive probing will be undertaken.
- 6.13 The proposed frequency for probing and coring is:
- Probe the southern section of the route on a 50m spacing to determine potential peat depth.
 - When a probe of >0.5m depth of penetration occurs the presence of peat will be checked with a corer. The cores will be undertaken to verify the actual peat depth, the thickness of the acrotelm, determine the mineral soil characteristics and allow for Von Post tests to be undertaken on the catotelm.
 - If peat is confirmed, probes will then be taken at 50m spacing both along the centre line of the overhead line or access track and at 30m offsets. This will provide a corridor of 60m for potential location adjustment.
 - Cores will be undertaken at representative locations to verify the actual peat depth, the thickness of the acrotelm, determine the mineral soil characteristics and allow for Von Post tests to be undertaken on the catotelm.
- 6.14 The data obtained from the site investigations will be used to produce maps of peat depths along the route including contoured peat depths within the corridor. In Scotland deep peat is classified at >1.0m and a shaded contour interval of 0-0.5m, >0.5m-1m, >1m – 1.5m, >1.5m-2m, >2m 3m, etc. will be used to demonstrate the occurrence of peat across the site and the avoidance of peat in the area of proposed infrastructure, on the EIA-Report figures.

- 6.15 The findings of the survey work and baseline assessment will contribute to environmental constraints mapping and will provide input and feedback into design iterations and subsequent environmental assessment. The peat survey results will also be used to inform the preparation of a peat management plan and peat landslide hazard risk assessment, if judged to be required on the basis of the type of access track construction and localised peat and slope conditions.

Likely Significant Effects

- 6.16 Potential effects on geology, hydrology, hydrogeology and water resources will be assessed as part of the EIA process. This will include the identification of both generic effects of construction (e.g. sediment release, pollution, fuel spills etc.) and effects on specific locations, such as sensitive habitats (i.e. GWDTEs, private water supplies (PWS), peatland habitats or watercourse crossings, which are sensitive to pollution risk and / or disturbance from required engineering works.
- 6.17 Potentially significant effects are considered more likely to occur during the construction phase. SPEN is committed to implementing good practice construction methods and has extensive working knowledge of construction methods due to constructing a number of similar overhead line projects throughout Scotland.
- 6.18 Taking account of the findings of the work undertaken to date, and professional experience, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction and/or operation of the proposed OHL include:
- pollution of surface water, including public/private drinking water supplies caused by releases of sediment to watercourses from excavated/stockpiled material during construction, or as a result of stream crossings or works near streams;
 - pollution of surface water and groundwater, including drinking water supplies, through operation of machinery (e.g. spillage of fuels, oils etc.) during site preparation and construction;
 - modifications to natural drainage patterns, changes to runoff rates and volumes and consequent increase in flood risk during construction and operation;
 - damage to river banks or changes in channel form due to the operation of machinery during construction and operation;
 - localised flooding and watercourse bank erosion caused by impediments to flow, particularly in conditions of high discharge;
 - Effects on peat (including potential peat instability).

Approach to Mitigation

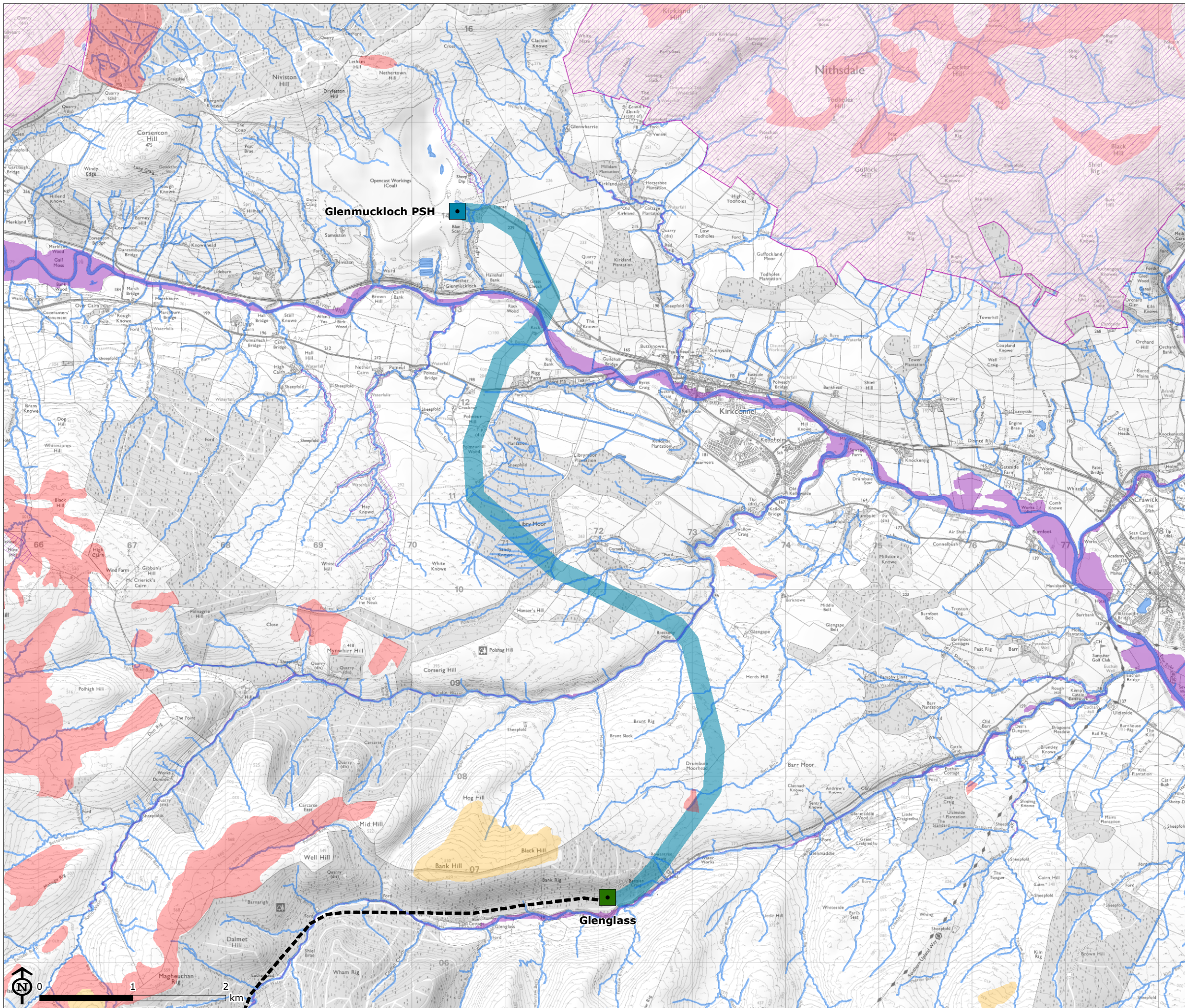
- 6.19 In addition to the careful siting of infrastructure components and given SPEN's commitment to, and prior experience of, implementing accepted good practice during construction and operation, and the current regulatory context, many potential effects on the water environment can be avoided or reduced. With respect to the current regulatory context, since the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) came into force, CAR authorisation will be required in relation to a number of activities e.g. engineering works in inland waters and wetlands. A Construction Site Licence (CSL) will also be required for the works under the CAR Regulations. Consultation with SEPA throughout the EIA process will be undertaken in relation to those activities for which a licence or registration is required.
- 6.20 As a consequence, a number of measures are not considered to be mitigation as such, but rather an integral part of the design/construction process as part of good practice; and it is proposed that these will be taken into account prior to assessing the likely effects of the connection. However, where appropriate, more tailored mitigation measures will be identified prior to determining the likely significance of residual effects.

Q6.1: Are there any additional sources of baseline information which should be referred to, to inform the appraisal of effects on hydrology, geology, hydrogeology and water resources?

Q6.2: Confirmation that proposed methodology is appropriate?

Q6.3: Are the proposed list of effects which are scoped in appropriate?

Figure 6.1: Biodiversity, Geological Conservation and Hydrology



- Glenmuckloch Pumped-Storage Hydro Substation (PSH)
- Existing Glenglass Substation
- Existing 132kV Overhead Line South West Scotland (SWS) Project
- Proposed Route**
- 132kV Proposed Route
- Biodiversity and Geological Conservation**
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Priority Peatland Habitats - Category 1 (SNH)
- Priority Peatland Habitats - Category 2 (SNH)
- Flood Risk Zones and Watercourses**
- Watercourse 10m Buffer
- Flood Risk (1 in 200 years)

Map Scale: 1:40,000 @ A3



7 Biodiversity

Introduction

- 7.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the construction and operational phases of the Glenmuckloch to Glenglass Reinforcement Project on Ecology and Ornithology (Biodiversity). Potential effects on both ecological and ornithological receptors are considered within this chapter.

Existing Conditions

Ecological

- 7.2 There are no statutory or non-statutory sites designated for their nature conservation value within the project Study Area.
- 7.3 Based on remote sensing studies, the Study Area supports a mosaic of habitats typical of the wider landscape; commercial forestry plantation, agricultural pasture and modified peatland habitats and upland grasslands in higher areas. The northern part of the Study Area comprises the former Glenmuckloch surface mine.
- 7.4 It is anticipated that the Study Area provides suitable sheltering and foraging for:
- Red squirrel
 - Pine marten
 - Badger
 - Bats
 - Otter
 - Water vole
 - Reptiles
 - Great crested newt
- 7.5 Ecological field studies commenced in mid-August 2019. These will further confirm the Study Area's habitats and protected species composition.

Ornithological

- 7.6 There are no designated ornithological areas within which the Glenmuckloch to Glenglass Reinforcement Project is proposed and desk and field surveys indicate the study area is generally of limited ornithological importance. However, the boundary of North Lowther Special Protection Area Site of Special Scientific Interest (SSSI) and the Muirkirk and North Lowther Upland Special Protected Area (SPA) lies approximately 1.7km to the north east of the consented Glenmuckloch PSH sub-station. The SPA/SSSI contains important bird habitat, supporting breeding populations of Merlin, Peregrine, Short-eared Owl and Golden Plover, and both wintering and breeding populations of Hen Harrier. See **Figure 6.1**.
- 7.7 A series of ornithological desk and field surveys have been undertaken within the study area to inform the routing stage. Field surveys, carried out in 2018, identified two species of waders of moderate conservation concern were recorded as breeding within the 500m survey buffer namely curlew (16 territories) and lapwing (3 territories), plus three species of lesser conservation concern: oystercatcher, snipe and common sandpiper. This survey buffer covered all the potential

route options, so the number of birds within the buffer of the proposed route is less at 7 curlew territory centres; and 3 lapwing within 500m of the proposed OHL route.

- 7.8 There were no black grouse sightings recorded during the 2018 surveys but a lek site, identified during the desk studies, within the survey area was occupied in 2018 but was not accessible; therefore no further information was available.
- 7.9 Sightings of peregrine and barn owl were recorded during surveys conducted between April and July. Peregrine and barn owl were confirmed to be breeding within the 2km survey buffer with peregrine in one location and barn owl in at least one location, within the 2km buffer of the OHL route. No goshawks were found, and the Raptor Study Group confirmed no breeding sites were located in the 2km buffer of the OHL route during 2018.

Methodology

Ecological

- 7.10 A detailed Desk Study will be undertaken to provide a robust understanding of the Study Area's potential ecological constraints. The Desk Study will include searches for:
- Statutory designated sites within 5km of the Study Area
 - Non-statutory designated sites within 2km of the Study Area
 - Existing records of protected species, through consultation with relevant organisations, including the South West Scotland Environmental Information Centre (SWSEIC)
- 7.11 Field studies commenced in August 2019 and will be completed during the 2019 survey season.
- 7.12 Surveys comprise an extended Phase 1 Habitat Survey of the proposed route, plus appropriate buffers (i.e. up to 250m along watercourses and out to 50m for all other areas). The Study Area's habitats will be rapidly classified and mapped in accordance with Phase 1 Habitat Survey methods. Where habitats of potential conservation concern are noted, vegetation will be subject to National Vegetation Classification (NVC) to allow more detailed analysis.
- 7.13 Habitats of potential conservation concern include:
- Habitats listed on Annex 1 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
 - Habitats listed on the Scottish Biodiversity List¹³;
 - Habitats listed on the Dumfries and Galloway Biodiversity Action Plan¹⁴;
 - Groundwater Dependent Terrestrial Ecosystems (GWDTEs)¹⁵;
- 7.14 The habitat survey will be extended to include an assessment of suitable sheltering and foraging habitat for protected species. Where possible, direct field signs will also be recorded, in line with current best practice methods. Likely species of interest include:
- Red squirrel
 - Pine marten
 - Badger
 - Bats
 - Otter
 - Water vole
 - Reptiles

¹³ Available at <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list>

¹⁴ Available at <https://swseic.org.uk/resource/dglbap-part3/>

¹⁵ SEPA (2017). Land Use Planning System Guidance Note 31

- Great crested newt

7.15 Upon completion of the Extended Phase 1 Habitat Survey, the need for further, targeted protected species surveys will be discussed with SNH at the earliest opportunity.

Ornithological

7.16 As outlined above, desk and field surveys have been undertaken to date with further detail provided below.

Desk Study

7.17 A desk study was carried out using existing and relevant ornithological data from published, publically available EIA Reports, namely Sanquhar Community Wind Farm, Lethans Wind Farm and the Southwest Scotland Renewables Connection Project.

7.18 Data was also collected through consultation with RSPB and the local Raptor Study Group (RSG). The RSPB provided a dataset of records from 2000 to 2016 which included records of black grouse and waders relevant to this project. The RSG data included breeding locations, occupancy and success for peregrine (from 2002 to 2018) and goshawk (2013 to 2018).

Field Survey

7.19 Information gathered during the desk study was used to inform ornithological field surveys. The following field surveys were carried out between April and July 2018:

- Moorland Breeding Bird Survey (April – July 2018)
- Black Grouse (mid-April – mid-May 2018)
- Scarce breeding raptors and owls (April – July 2018)

7.20 The surveys were agreed with Scottish Natural Heritage (SNH) and undertaken by suitably experienced professional ornithologists in line with SNH Guidance, with a final report submitted to SNH in February 2019.

7.21 Following receipt of the ornithological report, SNH confirmed that, in the context of the report findings, a single year of survey work was considered adequate to inform the EIA Report and S37 application. On this basis no further ornithological field surveys are proposed to be undertaken.

Likely Significant Effects

7.22 As ecological data is currently being collected, a precautionary approach is taken to the significance of potential effects associated with the construction and operation of the Glenmuckloch to Glenglass Reinforcement Project. At this early stage, potential significant effects include:

Ecological

- Permanent or temporary loss, fragmentation or disturbance of habitats of conservation concern during the construction phase. This may include GWDTes which, if identified, will be assessed in conjunction with the hydrology assessment;
- Permanent or temporary loss, fragmentation or disturbance of sheltering or foraging habitat of protected species during the construction phase.
- Direct effects on protected species, including mortality and disturbance as they relate to population viability.

Ornithological

- A short-term reduction in breeding or wintering bird populations, including those of conservation value, due to construction disturbance. This is unlikely to be significant on the basis of the relatively low ornithological importance of the study area and proposals for mitigating potentially significant effects as set out below.

- A long-term/permanent reduction in breeding or wintering bird populations due to collision mortality. No species with susceptibility to collision risk are present within the study area, with the potential exception of Black Grouse which will be considered in relation to collision risk on the basis of professional judgement.
- A long-term/permanent reduction in breeding or wintering bird populations due to electrocution mortality. The risk of electrocution to species present within the study area is considered to be minimal.

7.23 Informed by the desk and field survey work undertaken to date during the routeing stage, based on professional judgment it is considered that the potential ornithological effects listed above will not be significant. Therefore the ornithology effects will be scoped out of detailed assessment and will be given only brief treatment in the EIA-Report in accordance with the EIA Regulations.

Mitigation Measures

- 7.24 SPEN is committed to implementing accepted good practice during construction and operation of the Glenmuckloch to Glenglass Reinforcement Project, thereby ensuring that many potential effects on ecological and ornithological features can be avoided or reduced.
- 7.25 Following implementation of good practice measures, where potentially significant effects on ecological or ornithological features are identified, specific measures to prevent, reduce and where possible offset these adverse effects will be proposed.
- 7.26 Although, mitigation considerations at this stage are indicative, given that surveys have not yet been completed, measures likely to be utilised include:

Ecological

- Reinstatement of habitats to pre-construction conditions where possible;
- Careful timing of activities and other construction measures such as ramping of trenches and installation of dry culverts to avoid effects on protected species; and
- The production of Species Protection Plans where appropriate, which may include the rigors of the species licencing process. The species licensing process requires detailed and targeted mitigation, and if necessary biodiversity compensation.

Ornithological

- Phased construction in sensitive locations to avoid effects on breeding birds, in particular those listed on Wildlife and Countryside Act 1981;
 - Engineering solutions to eliminate/ minimise the risk of electrocution to susceptible perching birds;
 - Marking lines with bird deflectors in areas identified where birds are potentially susceptible to risk of collision (e.g. near black grouse leks).
- 7.27 Where appropriate, mitigation measures will be discussed with SNH and other relevant consultees before being finalised.

Q7.1: Are there any additional sources of baseline information which should be referred to inform the appraisal of effects on ecology and ornithology?

Q7.2: Confirmation that proposed methodology is appropriate?

Q7.3: Are the proposed list of effects which are scoped in and scoped out are appropriate?

8 Cultural Heritage

Introduction

- 8.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the Glenmuckloch to Glenglass Reinforcement Project on cultural heritage assets, including physical effects, setting change and cumulative effects. The assessment will cover effects arising from the construction and operation of the new 132kV overhead line.
- 8.2 In this context, cultural heritage is held to be *'the physical evidence for human activity that connects people with place, linked with the associations we can see, feel and understand'* (HES 2014; 2016).
- 8.3 It comprises tangible, physical assets including: historic buildings and structures; archaeological assets; the remains of past environments shaped by human action¹⁶; gardens and designed landscapes; historic landscapes and townscapes; and, other sites, features or places in the landscape that have the potential to provide information on past human activity. It also incorporates less tangible associations of place with events, such as historical battlefields, or with historical figures and folklore.

Existing Conditions

- 8.1 A 200m study area has been defined in relation to potential direct effects on cultural heritage features. A 5km radius study area has been defined, based on the potential for significant effects arising from setting change to heritage assets. At greater distances, such effects are judged to be unlikely due to the scale of the project with the steel towers having an average height of 27m.
- 8.2 There are no Scheduled Monuments in close proximity to the proposed route or with likely susceptibility to setting change. While Nithsdale has an extensive settlement record and, consequently, a rich archaeological heritage this is generally concentrated in valley floor locations. While there is the potential for some interaction with the Deil's Dyke – a linear earthwork of indeterminate date and function. While relatively poorly understood, it has the potential to be of national importance. However, the nature of the proposed development means that physical effects can be readily avoided and that the setting and relationship of the monument to the landscape would remain legible.
- 8.3 The settlements of Kirconnel, Sanquhar and Kelloholm contain clusters of Category B and C Listed Buildings. There are no Category A Listed Buildings within the study area. See **Figure 8.1**.

Methodology

- 8.4 A desk-based assessment and walkover field survey will be conducted for the 200m wide study area to identify all known cultural heritage assets, designated or otherwise, to identify potential direct effects on those assets and to inform consideration of the archaeological potential of the study area.
- 8.5 To inform the scope of the assessment of potential effects on the setting of cultural heritage assets, the 5km study area adopted for the LVIA is used. Sources consulted for the collation of data include:

¹⁶ Palaeoenvironmental remains (e.g. deposits potentially bearing plant macrofossils and/or pollen; peatland and fen habitats), and historically managed vegetation such as trees and hedgerows.

- Dumfries and Galloway archaeological sites index¹⁷;
- Historic Environment Scotland (HES) designated asset GIS data;
- Inventory of Gardens and Designed Landscapes;
- Conservation Areas designations and associated appraisals;
- Canmore (HES National Monuments Record Database);
- Ordnance Survey maps (principally 1st and 2nd Editions) and other published historic map held in the Map Library of the National Library of Scotland;
- Aerial Photographs – HES National Collection of Aerial Photography (NCAP) holdings (oblique, vertical) and Google Earth™;
- Available reports from other recent archaeological work undertaken in the area;
- The Scottish Palaeoecological Archive Database;
- Early Parish accounts (including Statistical Accounts);
- Local archives, societies and libraries, if recommended by Dumfries and Galloway Council
- Dumfries and Galloway Council’s archaeological advisors.

8.6 The desk-based assessment results have been collated to form:

- A gazetteer listing details of all designated heritage assets and non-designated assets of national importance, recorded within the Dumfries and Galloway Council archaeological site index and the HES Canmore database (where additional records exist), that are within the 5km study area and have predicted visibility of the Glenmuckloch to Glenglass Reinforcement Project.
- Site Location mapping (using GIS).

Likely Significant Effects

8.7 Taking account of the findings of the desk studies and consultation undertaken to date, whilst still adopting a precautionary approach at this preliminary stage, potential effects on cultural heritage associated with the construction and/or operation of the Glenmuckloch to Glenglass Reinforcement Project include:

- direct (physical) effects on assets of national, regional and local cultural heritage value;
- physical disturbance of undiscovered sites or features, including unforeseen buried remains of archaeological interest (partial or total removal, including severance of linear features);
- effects on the settings of cultural heritage assets, principally resulting from intervisibility between the asset and the Glenmuckloch to Glenglass Reinforcement Project¹⁸.

8.8 Informed by the work undertaken to date during the routeing stage, opportunities for avoiding direct effects through the design process and the limited potential for significant effects on the setting of features, based on professional judgment it is considered that the potential effects listed above will not be significant. Therefore, cultural heritage is proposed to be scoped out of detailed assessment.

8.9 This approach reflects the preliminary consultation response from Historic Environment Scotland, who noted in their response to the Glenmuckloch 132kV Connection Project Routeing and Consultation document, that there were no nationally important heritage assets within the study area and significant effects are not anticipated.

¹⁷ The index of archaeological sites, made available on the Council website, and the HES Canmore database was used as the most up-to-date spatial data available.

¹⁸ Guidance issued by Historic Environment Scotland (2016) notes that the setting of a heritage asset often extends beyond the property boundary or ‘curtilage’ of an individual historic asset into a broader landscape context. Both tangible and less tangible elements can be important in understanding the setting. Less tangible elements may include function, sensory perceptions or the historical, artistic, literary and scenic associations of places or landscapes. These will be considered within the assessment.

Approach to Mitigation




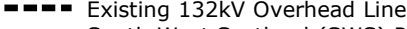



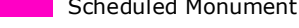
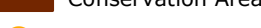
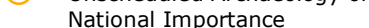
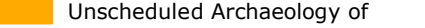
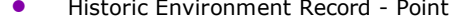
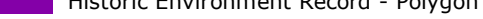
- 8.10 In addition to careful siting of infrastructure to seek to avoid and/or minimise direct effects on cultural heritage assets, SPEN is committed to implementing accepted good practice during the construction and operation of the connection, thereby ensuring that many potential effects on cultural heritage assets can be avoided or reduced.
- 8.11 Where adverse effects on cultural heritage assets are identified, measures to prevent, reduce, and/or where possible offset these effects will be proposed. Measures which may be adopted include:
- The fencing off or marking out of sites or features of cultural heritage importance in proximity to working areas;
 - An archaeological watching brief, if required, during construction activities in, or in proximity to, areas of particular concern;
 - Implementation of a working protocol should unrecorded archaeological features be discovered.
 - Archaeological recording in advance of construction activities where avoidance of sites or features is not feasible

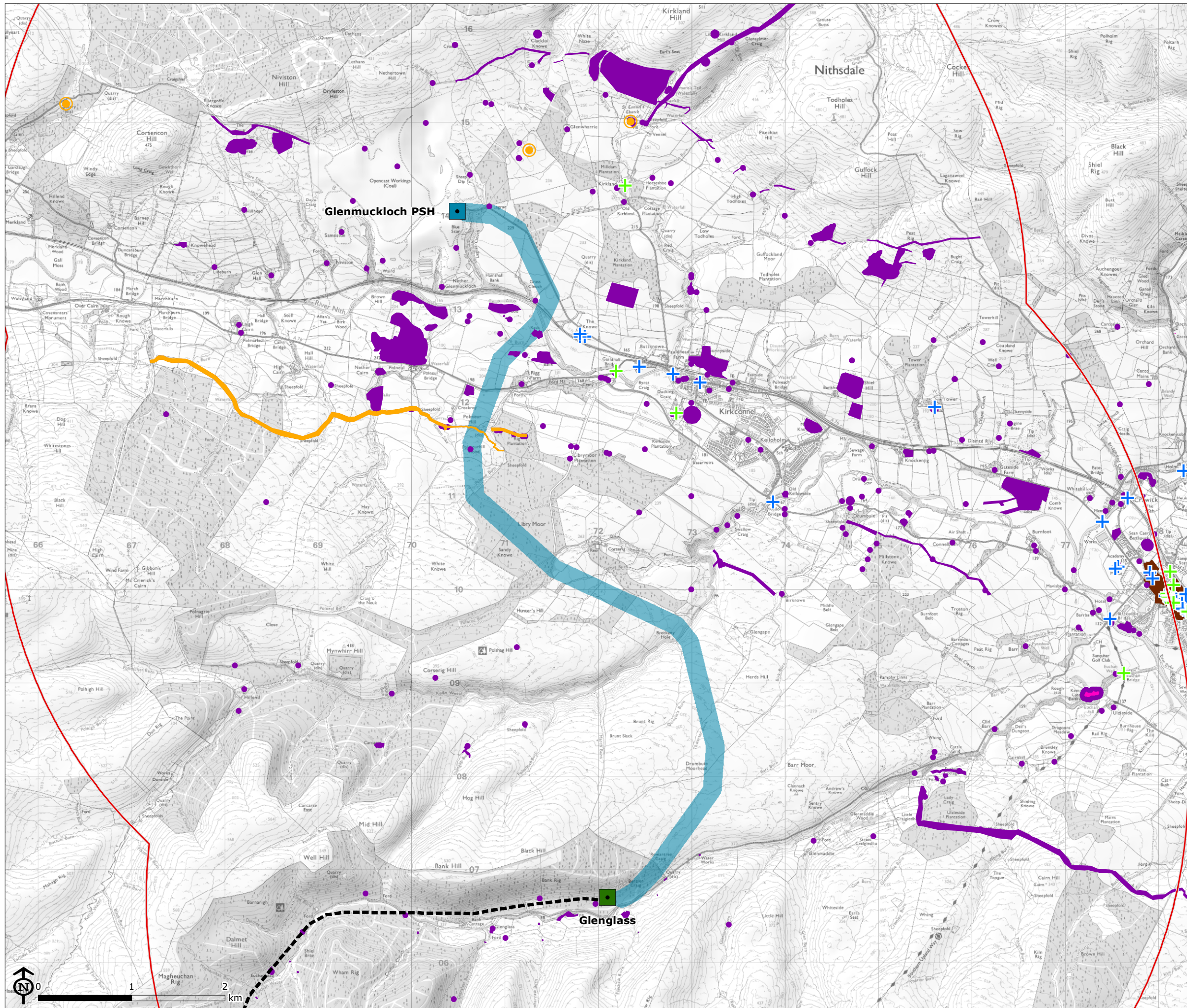
Q8.1: Are there any additional sources of baseline information which should be referred to, to inform the appraisal of effects on cultural heritage?

Q8.2: Confirmation that proposed methodology is appropriate?

Q8.3: Are the proposals to scope out cultural heritage from detailed assessment appropriate?

Figure 8.1: Cultural Heritage Features

-  Glenmuckloch Pumped-Storage Hydro Substation (PSH)
-  Existing Glenglass Substation
-  5km Study Area
-  Existing 132kV Overhead Line South West Scotland (SWS) Project
- Proposed Route**
-  132kV Proposed Route
- Cultural Heritage**
-  Listed Building - Category B
-  Listed Building - Category C
-  Scheduled Monument
-  Conservation Area
-  Unscheduled Archaeology of National Importance
-  Unscheduled Archaeology of National Importance - Deils Dyke
- Undesignated Archaeology of Regional / Local Importance (HER)**
-  Historic Environment Record - Point
-  Historic Environment Record - Polygon



Map Scale: 1:40,000 @ A3



9 Forestry

Introduction

- 9.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the Glenmuckloch to Glenglass Reinforcement Project on forestry during construction and operation.

Existing Conditions

- 9.2 A key design objective has been to avoid routeing the OHL through forestry, where possible and on balance with other environmental considerations, to minimise felling required for the wayleave. An appraisal considering the effects on forestry was undertaken as part of the routeing stage.
- 9.3 The Proposed Route includes several areas of woodland, in particular areas of commercial forestry as classified on the National Forestry Inventory adjacent to the Glenglass substation and Libry Moor plantation as shown in **Figure 9.1**. Areas of Ancient Woodland Inventory (AWI) and Native Woodlands from the Native Survey of Scotland (NWSS) will continue to be avoided during detailed alignment stage, where possible.
- 9.4 The forestry assessment includes all conifers and broadleaved trees, woodlands and forests potentially affected by the Glenmuckloch to Glenglass Reinforcement Project. Approximately 3km of the route will pass through forestry, largely consisting of young, commercial forestry.

Methodology

- 9.5 Both desk-based and onsite surveys will be undertaken to assess local forest conditions, extent of tree clearance required and the effect of this on current forest management practices.
- 9.6 The methodology will also consider existing Forestry Management Plans and incorporate existing long term management works into the tree clearance proposals where practicable on the basis that clearance associated with the OHL will affect the existing location and quantities of tree clearance proposed by the landowners and adjoining land.
- 9.7 The consideration of potential forestry effects will take account of:
- existing, and planned, windfirm boundaries to minimise sterilisation of commercial woodland areas and reduce the requirements for additional felling outwith the wayleave;
 - forest design plans through liaison with forestry owners/managers to avoid, or reduce restrictions on forest management operations/techniques e.g. maintaining access to woodland blocks for harvesting/safety; and
 - identification of opportunities to retain and/or plant particularly lower growing shrub species within the wayleave (where appropriate).

Likely Significant Effects

- 9.8 Adopting a precautionary approach, at this preliminary stage, possible effects associated with the felling/construction and operation of the Glenmuckloch to Glenglass Reinforcement Project, which may be potentially significant include:
- The long term loss of forest as a result of the operation of the line (the resilience corridor/wayleave).

- 9.9 Informed by the work undertaken to date during the routeing stage, and previous experience of forestry assessment, based on professional judgment it is considered that the following potential effects will not be significant, and will therefore be given brief treatment in the EIA-Report.
- Temporary loss of forest resource associated with the felling of trees for the creation of temporary construction compounds, accesses and quarries.
 - Loss of ancient and semi-natural woodland (through avoidance during detailed design).
 - The effects on shelter for agriculture.
 - Effects on deer stalking.
 - Effects on forest management during construction and operation.

Approach to Mitigation

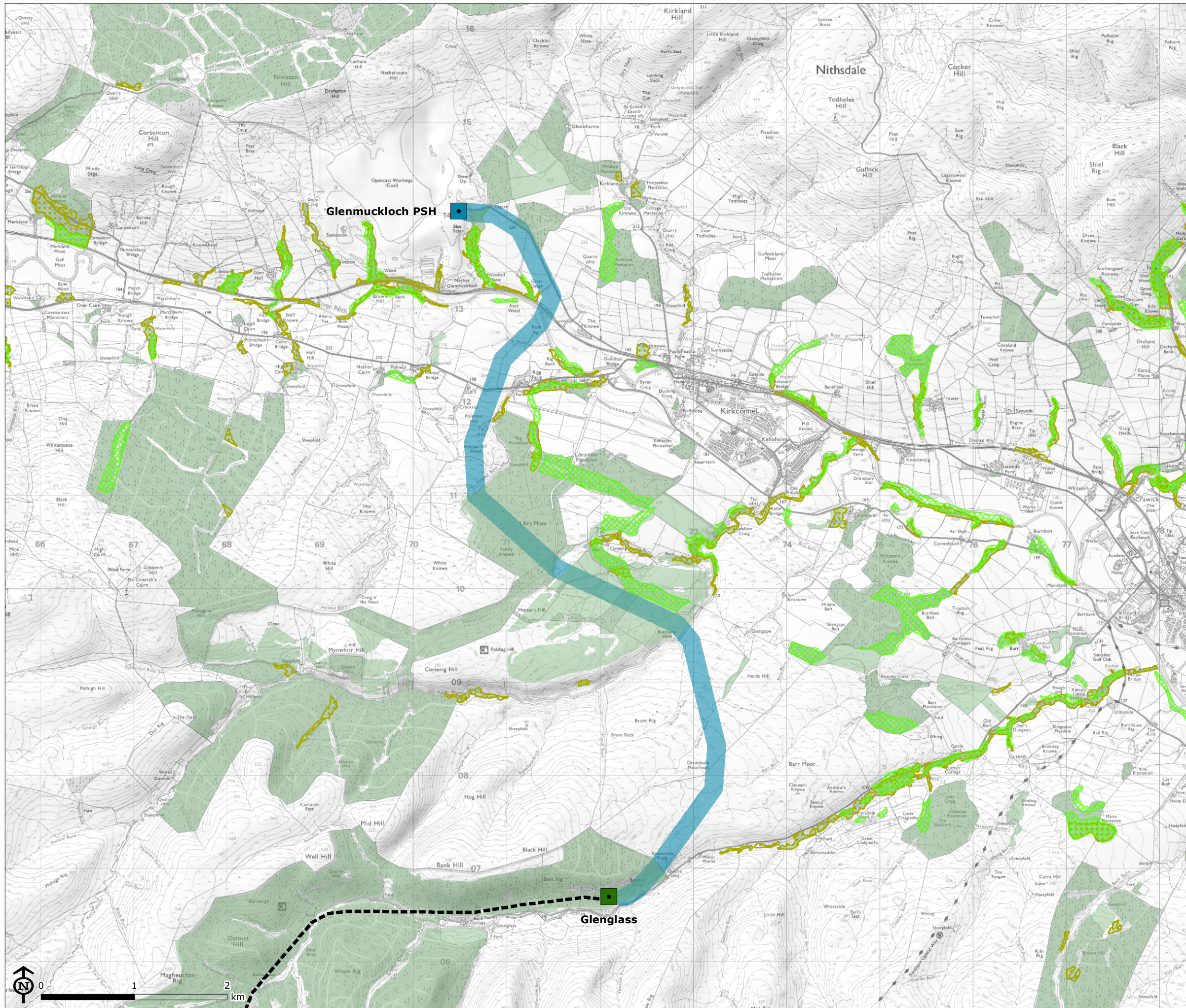
- 9.10 Where potentially significant forestry effects are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed. The mitigation measures proposed will draw on guidance and best practice and will be appropriate to the nature and significance of the effect identified.
- 9.11 Possible mitigation measures will be developed by SPEN in consultation with Scottish Forestry, as the primary forestry consultee, and forestry landowners including Forest and Land Scotland, and may include:
- Additional tree clearance out with the normal 80m wide corridor for reasons of landscape benefit or to create a windfirm forest edge.
 - Crowning or lopping of branches to avoid felling of the entire tree.
 - Opportunities for forestry mitigation works to combine with the development of ecological diversity both within the 80m corridor where some low growing shrub and tree planting can be considered and also for areas out with the corridor.
 - Identification of areas for mitigation felling to windfirm boundaries as a method to reduce the risk of wind damage to forest outwith the wayleave corridor.

Q9.1: Are there any additional sources of baseline information which should be referred to, to inform the appraisal of effects on cultural heritage?

Q9.2: Confirmation that the proposed methodology is appropriate?

Q9.3: Are the proposed list of effects which are scoped in and scoped out are appropriate?

Figure 9.1: Forestry



- Glenmuckloch Pumped-Storage Hydro Substation (PSH)
- Existing Glenglass Substation
- Existing 132kV Overhead Line South West Scotland (SWS) Project
- Proposed Route**
- 132kV Proposed Route
- Forestry**
- Ancient Woodland Inventory (AWI)
- Native Woodland (NWS)
- National Forestry Inventory (NFI)

Map Scale: 1:40,000 @ A3



10 Traffic and Transport

Introduction

- 10.1 This chapter sets out the proposed approach to the assessment of the potentially significant traffic and transport effects associated with the construction of the proposed Glenmuckloch to Glenglass Reinforcement Project. This assessment will consider potential effects of the proposed Glenmuckloch to Glenglass Reinforcement Project traffic upon communities and road users.
- 10.2 The assessment of effects on traffic and transport will be carried out in line with relevant legislation and standards, as well as having regard to the following guidance:
- Institution of Highways and Transportation (IHT) (1994), Guidelines for Traffic Impact Assessment;
 - Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment / IEMA) (1993), Guidelines for the Environmental Assessment of Road Traffic, Guidance Notes No. 1 [referred to as the IEMA Guidelines]; and
 - Transport Scotland (2012), Transport Assessment Guidance.

Existing Conditions

- 10.3 The proposed Glenmuckloch to Glenglass Reinforcement Project would be located within predominantly rural areas within Dumfries and Galloway. The main communities within the vicinity of the proposed route of the OHL are Kirkconnell and Kelloholm with Sanquhar located further away to the east. There are also some isolated, residential properties and farm buildings in the locality.
- 10.4 The main transport link for these communities and individual properties is the A76 strategic trunk road, administered by Transport Scotland, between Kilmarnock and Dumfries. The Glasgow South Western Line railway, between Glasgow and Carlisle via Kilmarnock and Dumfries also serves the area.
- 10.5 Many communities and individual properties are served by a number of 'C' class and unclassified local public roads.
- 10.6 The Glenmuckloch to Glenglass Reinforcement Project will be serviced by several worksites, which can be individually accessed by existing and/or newly formed track sections. The track sections will in turn link to local public roads or the A76 trunk route; administered by Dumfries & Galloway Council or Transport Scotland respectively, either via existing or newly formed access locations.

Methodology

- 10.7 The study area for the assessment will include public road sections (in vicinity of the development worksites) which construction traffic will logically utilise. This is likely to include:
- Blackaddie Road (C128N);
 - the C125N;
 - Lagrae Road (U459N); and
 - Euchan Water Road (U432N), and/or existing Whiteside Hill WF/SWS/Sanquhar WF main access track.

- 10.8 Construction phase vehicular access routes will be driven, access constraints examined, and sensitive receptors identified. Video, photographs, key dimensions (including visibility splays) and GPS co-ordinates will be recorded. Automatic traffic counters will be placed at strategic locations along with manual sample traffic counts (peak and inter-peak) as necessary to supplement traffic data obtained from roads authorities.
- 10.9 Road traffic (personal injury) accident data will be sourced from local authorities where potential accident 'blackspots' (cluster sites) are highlighted by stakeholders. These will be collated for analysis during the EIA phase.
- 10.10 The predicted significance of effects will be determined through a standard method of assessment based on professional judgement and the application of appropriate evaluation criteria. The IEMA (Institute of Environmental Management and Assessment) Guidelines¹⁹ will be adopted accordingly.
- 10.11 Traffic generation will be calculated through the analysis of required construction materials, plant and staffing volumes, aligned with the construction programme. The distribution of Development traffic across the public road network will be estimated considering the location of worksite access locations relative to local generators of construction traffic, such as quarries and settlements.
- 10.12 Qualitative effects which might not be identified through strict quantitative evaluation will be considered via professional judgement. The IEMA Guidelines identify a variety of effects which may result from an increase in traffic and where the increase in traffic is considered to be potentially significant, possible environmental effects will be considered in greater detail.
- 10.13 Professional judgement will also be used to assess whether residual effects (following the application of mitigation measures) are likely to be significant.
- 10.14 It is also important to consider the possibility of cumulative effects resulting from the simultaneous construction or operation of significant development in the vicinity of the proposed Glenmuckloch to Glenglass Reinforcement Project. Those developments will be considered which have the potential to use roads within the defined Study Area at the same time as the Glenmuckloch to Glenglass Reinforcement Project.

Likely Significant Effects

- 10.15 Adopting a precautionary approach, at this preliminary stage, potentially significant effects associated with the Glenmuckloch to Glenglass Reinforcement Project, include:
- Effects of felling and construction traffic on existing traffic flows, and the local and trunk road network; and
 - Cumulative effects with other developments, including on traffic flows during construction of overhead lines.
- 10.16 Based on professional judgement and experience in the assessment of traffic and transport effects associated with overhead line projects, additional effects which, at this preliminary stage, are not anticipated to be significant include:
- effects of operational and maintenance vehicles on existing traffic flows and the local road network, it is proposed to scope out the operational and maintenance effects of traffic and transport. Operational overhead power lines are subject to an annual maintenance inspection with any further visits generally being the result of unplanned outages on the line. These visits are infrequent and are unlikely to generate significant volumes of traffic therefore effects will be negligible during operation;
 - effects on the trunk road sections local to the Glenmuckloch to Glenglass Reinforcement Project (essentially the A76) given residual capacity and strategic nature and that this development is unlikely to result in an intensification of use exceeding 10% of the existing

¹⁹ Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment / IEMA) (1993), Guidelines for the Environmental Assessment of Road Traffic, Guidance Notes No. 1

Annual Average Daily Traffic (AADT) on any link section on this route; this assumption will be verified or otherwise through the EIA process;

- 'road safety' is not anticipated to be a significant issue, assuming an appropriate construction traffic management plan is developed and implemented. Nonetheless, road traffic accident historical data will be sourced and appraised, with due consideration given to any intensified use, as a result of traffic generated by the Development upon public road sections in the local area;
- Construction traffic noise effects on the basis that construction traffic movements will be distributed over the existing road network and the proposed new accesses during construction and are of temporary/short duration; and
- air quality effects resulting from temporary construction traffic on the basis that the Glenmuckloch to Glenglass Reinforcement Project will be accessed via a number of geographically distinct roads and access points and therefore traffic related emissions will be diffused throughout the Study Area.

Approach to Mitigation

10.17 Where potentially significant traffic and transport effects are identified, measures to prevent reduce and, where possible, offset these adverse effects will be proposed. The mitigation measures proposed will draw on guidance and best practice, and will be appropriate to the nature and significance of the effect identified.

10.18 Mitigation measures are likely to include:

- preparation of a Construction Traffic Management Plan for the construction phase of the scheme;
- the use of approved access routes to site only (including for general construction traffic, and site personnel as appropriate);
- vehicle wheelwash facilities at worksite access points; and
- no parking of construction plant, equipment, and vehicles offsite on public roads.

10.19 SPEN will be committed to implementing all the mitigation measures identified in the traffic and transport assessment.

Q10.1: Confirmation that proposed methodology is appropriate?

Q10.2: Are the proposed list of effects which are scoped in and out appropriate?

11 Other Issues

Introduction

- 11.1 This chapter sets out the proposed approach to the assessment of Other Issues, including Electric Magnetic Fields (EMF) and Major Accidents and Disasters associated with the construction and operation of the proposed Glenmuckloch to Glenglass Reinforcement Project. The EIA will consider the effects of operation of the proposed overhead line upon EMFs and the construction and operation of the OHL in relation to Major Accidents and Disasters.

EMF

Baseline

- 11.2 Electric and magnetic fields (EMFs) are produced both naturally and as a result of human activity. The earth has both a magnetic field (produced by currents deep inside the molten core of the planet) and an electric field (produced by electrical activity in the atmosphere, such as thunderstorms).
- 11.3 Wherever electricity is used there will also be electric and magnetic fields. This is inherent in the laws of physics - we can modify the fields to some extent, but if we are going to use electricity, then EMFs are inevitable.
- 11.4 Like many other things that we encounter in nature, EMFs can be harmful at high-enough levels. But the fields required, for example, to start interfering with the body's nervous system are much greater than those produced by the UK electricity system.

Methodology

- 11.5 Although no significant effects are expected, potential EMF effects and recent research evidence will be considered in the EIA, together with the conclusions of the national and international bodies who have reviewed the evidence for possible health effects.

Likely Significant Effects

- 11.6 Potential EMF effects and recent research evidence will be considered in the EIA.

Major Accidents and Disasters

Baseline

- 11.7 The study area has been subject to historic coal mining activities, at depth and at surface, and encroaches into the Coal Authority's defined Development High Risk Area (at the northern end near the PSH substation). Flood and potential peat slides risk may also be present within the area.

Methodology

- 11.8 It is considered likely that a Coal Mining Risk Assessment (CMRA) will be required. The CMRA will consider whether there are any risks to the Project from, for instance:
- the presence of recorded mine entries;
 - whether the project area lies within the zone of influence of past or present underground or shallow mining;

- the potential for unrecorded shallow mine workings or entries to be present in the general area of the proposed overhead line; and
 - whether there have been any records of mine gas emissions in the area.
- 11.9 Flood risk and peat slide will be covered in the Hydrology, Geology, Hydrogeology and Water Resources Chapter. The findings from the assessment of flood risk and peat slide will be compiled within the Major Accidents and Disasters Chapter.
- 11.10 General health and safety procedures will be set out in a CEMP.

Likely Significant Effects

- 11.11 No likely significant effects are anticipated.

12 Topics and Effects Proposed to be Scoped Out

- 12.1 The aim of this EIA Scoping Report is to identify the information to be included in the EIA. In doing so, certain EIA topics and effects associated with a particular topic proposed for inclusion in the EIA, may be 'scoped out'. This is because the potential for significant effects has been deemed unlikely, on the basis of the work undertaken to date, responses to routeing and SPEN's experience in the construction and operation of 132kV steel tower OHLs. In addition to those topics and effects covered in the previous chapters, the following section provides details of the topics and effects that are intended to be 'scoped out' of the EIA.

Topics

Construction and Operational Noise

Construction of new 132kV OHL

- 12.2 Glenmuckloch to Glenglass Reinforcement Project passes through predominantly rural areas, comprising agricultural land interspersed with areas of commercial woodland and avoids the main settlements of Kirkconnel, Kelloholm and Sanquhar. There are, however, some smaller clusters of farmsteads and individual residential properties within the study area. The existing baseline noise environment in the more rural sections of the route is likely to be characterised by 'natural' sources such as wind and disturbed vegetation, with some contribution from anthropogenic sound such as distant road traffic and agricultural or forestry activity. Towards the northern section, the baseline noise environment is likely to be further characterised by sound from anthropogenic sources – several sections of the Glenmuckloch to Glenglass Reinforcement Project either passes over or lies in close proximity to the A76, as well as crossing over a railway line.
- 12.3 In assessing the effects of noise associated with the construction of OHLs, it is accepted that the associated works, which are linear in the geographical extent, are of a short duration at any one location. The noise generated by construction activities associated with the OHL will quickly diminish as the construction progresses, moving the activity away from each noise-sensitive location as construction continues.
- 12.4 Due to the short term and localised nature of the construction process, any temporary noise created during construction is likely to be minimal and concentrated in small areas at any one time as the contractors progress along the course of the route. It is therefore considered appropriate to scope out the assessment of noise resulting from the construction and of the OHL.
- 12.5 In addition, SPEN is committed to implementing accepted good practice measures for controlling construction noise, which may include the following, as appropriate:
- restricted hours of construction works to avoid sensitive periods;
 - the use of equipment with appropriate noise control measures (e.g. silencers, mufflers and acoustic hoods);
 - the positioning of temporary site compounds as far as practicably possible from neighbouring residential properties; and
 - additional good practice measures as set out in BS5228:2009.

Operation of the new 132kV OHL

- 12.6 Operating high voltage overhead lines can generate audible noise, the level of which depends upon the operating voltage and the choice of conductor system. Noise from overhead lines is produced by the phenomenon of 'corona discharge', this being a very limited breakdown of the air at points around the surface of the conductor. Conductor systems are designed and constructed to minimise corona discharge, but inevitable surface irregularities caused by surface damage or by deposition of surface contaminants such as insects, organic material such as seeds and dust,

raindrops or pollution may locally enhance the electric field strength sufficiently for corona discharge to occur. The discharge can be audible in certain circumstances and would be heard as a crackling sound sometimes accompanied by a low frequency hum. Noise levels would increase during periods of rainfall.

- 12.7 On this basis, it is considered that there will be no significant noise effects during the operation of the proposed OHL. Therefore, it is proposed that this topic is 'scoped' out and not given detailed consideration in the EIA. The construction process and proposed methods of noise control will however be outlined within the development description chapter of the EIA Report.

Air Quality (including dust)

- 12.8 During construction, the operation of equipment, staff transport, construction vehicles and machinery will result in atmospheric emissions of waste exhaust gases containing NO_x, NO and PM₁₀ pollutants. The quantities emitted will depend on engine type, vehicle age, service history and fuel composition.
- 12.9 Based on professional judgement it is considered that the number of vehicle movements anticipated to arise from construction and operation from the Glenmuckloch to Glenglass Reinforcement Project would not result in any exceedance of air quality standards either at the site or within the wider area. As such, it is proposed to scope out air quality from detailed assessment as part of the EIA.
- 12.10 The final alignment of the OHL, including access tracks and compounds etc. will be designed to seek to avoid being located within 200m of residential properties where possible. The siting of temporary construction infrastructure in combination with dust suppressing good practice measures will ensure no significant dust effects will occur.

Socio-Economics, Recreation and Tourism

- 12.11 Due to the short term and localised nature of the construction process, any temporary disturbance created during construction is likely to be minimal and concentrated in small areas at any one time as the contractors progress along the course of the proposed connection route. Once the connection is in place, there will be no further works required unless maintenance works are needed and use of the land can continue as normal, with the exception of the landtake along the route. As the construction process requires only a small labour force and is short in duration, this also means it is unlikely that the employment created will affect local employment levels or generate a significant source of income for the area.
- 12.12 In relation to tourism, no tourist attractions are noted within 5km of the proposed OHL (the SUW is included as a viewpoint in the LVIA). Furthermore, it is recognised that there are already existing OHLs and wind farms within the area which are not considered to have adversely affected tourism within the area. On this basis, potential effects on tourism are not considered likely to be significant.
- 12.13 In terms of recreation, the Glenmuckloch to Glenglass Reinforcement Project route crosses one Dumfries and Galloway core path (Core Path 84 – Kirkconnel and Mynwhirn Hill) and the Burn Heritage Trail (A76). The Southern Upland Way is situated to the south of the proposed route whereby the OHL would be visible in the context of the surrounding wind turbines. Whilst temporary diversions may be required during construction, as noted previously construction works at any one location will be short in duration therefore the impact of a diversion would be limited. All recreational paths would be open during operation of the OHL.
- 12.14 Dumfries and Galloway Council raised no objection to the application in regard to effects on core path access. It is therefore proposed that effects on socio-economics, tourism and recreation are scoped out from detailed assessment within the EIA.

Climate Change

- 12.15 It is considered to be unlikely that the Glenmuckloch to Glenglass Reinforcement Project will lead to significant effects on climate, however consideration of this topic will be given within relevant chapters in the EIA where applicable. This will include the identification of the likely consequences of climate change for baseline conditions/assessment findings and the resilience of proposed

mitigation measures to any projected changes in extreme weather, including heavy rainfall events.

Health

- 12.16 The EIA Regulations require that potential effects on human health are considered. However, it is not proposed to undertake a separate assessment of potential effects of the proposed development on human health on the basis that noise, air quality, EMF, traffic and socio-economic impacts are being proposed to be scoped out of the EIA. Furthermore, it is considered that air quality, noise and dust will be adequately mitigated through implementation of good practice construction methods.

Q12.1: Are the proposed list of topics considered acceptable to scope out?

Appendix 1

Proposed Structure of the EIA Report

PREFACE

NON-TECHNICAL SUMMARY

1. INTRODUCTION

- RATIONALE FOR THE GLENMUCKLOCH TO GLENGLOSS REINFORCEMENT PROJECT
- LEGISLATIVE REQUIREMENTS FOR EIA
- RESPONSIBILITIES FOR THE EIA REPORT
- STRUCTURE OF THE EIA REPORT

2. APPROACH TO THE EIA

- INTRODUCTION
- THE EIA PROCESS
- SCOPE OF THE EIA
- THE DO NOTHING SCENARIO

3. DEVELOPMENT DESCRIPTION

- INTRODUCTION
- STUDY AREA DESCRIPTION
- DEVELOPMENT DESCRIPTION
- CONSTRUCTION PROCESS
- OPERATIONAL DETAILS

4. PLANNING AND POLICY CONTEXT

- INTRODUCTION
- PLANNING POLICY CONTEXT

5. DESIGN STRATEGY

- OVERVIEW OF ROUTEING METHODOLOGY
- PROPOSED ROUTE
- MODIFICATIONS TO SCHEME DESIGN DURING EIA

6-11. LANDSCAPE AND VISUAL AMENITY; HYDROLOGY; BIODIVERSITY; CULTURAL HERITAGE; FORESTRY; TRAFFIC AND TRANSPORT; OTHER ISSUES

- INTRODUCTION
- ASSESSMENT METHODOLOGY
- EXISTING CONDITIONS
- PROPOSED GOOD PRACTICE MEASURES
- ASSESSMENT OF CONSTRUCTION EFFECTS
- ASSESSMENT OF OPERATIONAL EFFECTS
- CUMULATIVE EFFECTS
- MITIGATION AND FUTURE MONITORING
- RESIDUAL EFFECTS
- SUMMARY AND CONCLUSIONS

12. SUMMARY OF EFFECTS

FIGURES

APPENDICES

Appendix 2

List of Potential Consultees

The following consultees will be contacted by the Scottish Government Energy Consents Unit in relation to the scope of the EIA:

- Scottish Government Energy Consents Unit (ECU)
- Dumfries and Galloway Council
- Kirkcubrecht and Kelloholm Community Council
- Royal Burgh of Sanquhar and District Community Council
- Penpont Community Council
- Scottish Natural Heritage (SNH)
- Historic Environment Scotland (HES)
- Scottish Environment Protection Agency (SEPA)
- Forestry Commission Scotland
- Marine Scotland
- Transport Scotland
- Scottish Water
- Scottish Rights of Way and Access Society (ScotWays)
- Crown Estate Scotland
- Health and Safety Executive (HSE)
- The National Trust for Scotland
- Civil Aviation Authority (CAA)
- National Air Traffic Services (NATS)
- BT
- Sustrans Scotland
- Visit Scotland
- BAA (Glasgow Airport)
- Glasgow Prestwick Airport
- Fisheries Management Scotland
- The Scottish Wildlife Trust
- The Coal Authority
- British Horse Society
- Defence Infrastructure Organisation (DIO)
- Association for the Protection of Rural Scotland (APRS)
- Royal Society for the Protection of Birds (RSPB)
- Scottish Wild Land Group (SWLG)
- Mountaineering Council of Scotland (MCofS)
- John Muir Trust

- Joint Radio Company
- West of Scotland Archaeology Service (WoSAS)
- Nith Catchment Fisheries Trust