Andershaw to Coalburn 132kV Overhead Line Environmental Statement

April 2009

SP TRANSMISSION

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Preface

The Andershaw to Coalburn 132kV Overhead Line Environmental Statement is published as a single document comprising three volumes:

- **Volume 1** Non-Technical Summary
- **Volume 2** Environmental Statement
- **Volume 3** Appendices

The ES sets out the findings of the Environmental Impact Assessment (EIA) undertaken for the proposed overhead line connection between Andershaw Windfarm and Coalburn Substation following the requirements of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000.

Further copies of all these reports may be obtained from:

SP Energy Networks
Environmental Planning
3 Prenton Way
Prenton
Merseyside
CH43 3ET
Tel: 0151 609 2568

Copies of the Environmental Statement may be obtained from SP Transmission (tel: 0151 609 2568) at a charge of £120 for a hard copy and £10 for a DVD copy. Copies of a short standalone Non Technical Summary are available free of charge. Copies of the documents will be available for public viewing at the following locations:

Council Offices:

South Lanarkshire Council
Clydesdale Planning and Building Standards area office
South Vennel
Lanark
ML11 7JT

Libraries:

Lanark Library
16 Hope Street
Lanark
ML11 7LZ

Lesmahagow Library
48 Abbeygreen
Lesmahagow
ML11 0EF

Other locations:

St Brides Hall
Braehead
Douglas
ML11 0QW

Any representations to the application should be made by completing the online representation form on The Scottish Government, Energy Consents website at:

http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-Consents/Support-object

Or by email to The Scottish Government, Energy Consents Unit mailbox at:

energyconsents@scotland.gsi.gov.uk

Or by post to:

The Scottish Government,
Energy Consents Unit,
2nd Floor,
Meridian Court,
5 Cadogan Street,
Glasgow,
G2 6AT

Representations should be dated and should clearly state the name (in block capitals) and full return email or postal address of those making representation. All representations to the Scottish Government will be copied in full to the planning authority, and made available to the public on request, unless individuals request otherwise.

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Non Technical Summary

1. Introduction

1.1 Project Background

Catamount Energy Limited and Force 9 Energy are jointly developing a 14 turbine windfarm, Andershaw windfarm, approximately 4km south of Douglas in South Lanarkshire. As part of the windfarm project, the developers require the proposed windfarm to be connected to the electricity transmission grid. A 132kV grid connection from Andershaw windfarm to Coalburn substation is proposed.

The responsibility for providing the grid connection to the high voltage electricity transmission grid falls upon SP Transmission Ltd (SPT), the Transmission Licence holder for the south of Scotland. SPT is obliged under the Electricity Act 1989:

"to develop and maintain an efficient, co-ordinated and economical system of electricity transmission".

As well as being required to provide Andershaw windfarm with a grid connection, Schedule 9 of the Electricity Act 1989 requires SPT to take account of the environment when planning new overhead line developments. It states that SPT must:

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

(b) 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."

With these obligations in mind SPT has developed the Andershaw to Coalburn 132kV overhead line. Through the line design process SPT have sought to develop a grid connection which balances technical and economic considerations with environmental issues.

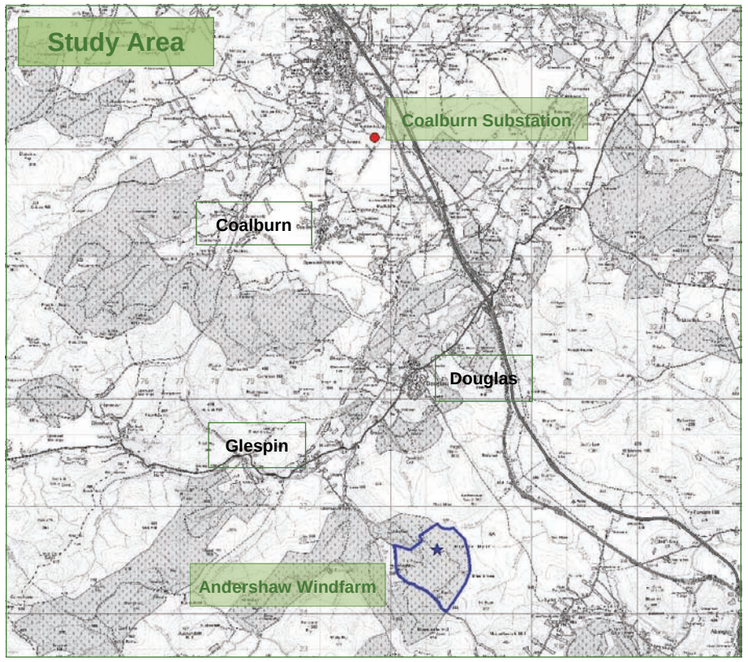
It should be noted that the need for the grid connection is related to the out-come of the planning application for Andershaw windfarm. The proposed overhead line will only be constructed if the windfarm developers obtain permission to construct Andershaw windfarm.

The study area is centred on the Douglas Valley and is illustrated below showing the locations of the proposed Andershaw windfarm and Coalburn substation. Andershaw windfarm is located south of the Douglas Valley in an area of commercial plantation. Coalburn substation is located approximately 11.5 km due north adjacent to Coalburn Moss and the B7078.

1.2 EIA of the Scheme

In accordance with the Electricity Act 1989, SPT has submitted a Section 37 application to the Scottish Government for permission to construct and operate the 132kV transmission line.

The requirements to undertake a statutory Environmental Impact Assessment (EIA) as part of Section 37 application are set out in the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000. Whilst the requirement to undertake a statutory EIA can be established through Screening the proposal with the Scottish Government, SPT, mindful of their responsibilities to people and the environment, as well as their statutory duties; consider it appropriate to undertake an EIA for this overhead line development.



1.3 The Environmental Statement

As part of the Section 37 application SPT have prepared and submitted an Environmental Statement (ES) which describes the findings of the EIA. It identifies the adverse and/or beneficial environmental impacts of the scheme and the measures that will be taken to avoid, reduce or offset those impacts.

The topics considered within the EIA and the approach to undertaking the assessment were established following receipt of a Scoping Opinion from the Scottish Government. This document also provided the views of South Lanarkshire Council, SNH, SEPA and Historic Scotland. Those topics identified for consideration within the EIA included:

- Land Use, Access & Recreation;
- Landscape & Visual Amenity;
- Ecology & Nature Conservation;
- Ornithology;
- Cultural Heritage & Archaeology;
- Ground Conditions & the Water Environment.

2. Description of Proposal

2.1 Development of the Scheme

The proposed overhead line connection between Andershaw windfarm and Coalburn substation has been identified following a detailed routeing study which considered the environmental, technical and economic constraints to overhead line development within the area. The study involved a number of key stages including consideration of a number of alternative connection routes.

KEY STAGES IN THE PROJECT

Identification of a Preferred Route:

Environmental constraints, in particular landscape and visual issues, were a principal consideration in the development and appraisal of a number of route options. The appraisal resulted in the identification of the Preferred Route.

Consultation and Scoping the Preferred Route:

The results of the routeing study were reported on within a Consultation Document. The Preferred Route was then subject to consultation with statutory and non-statutory consultees including SNH and SEPA. At the same time public consultation was undertaken; exhibition boards were put in place in St Brides Hall in Douglas and Coalburn Leisure Centre and SPT met with Douglas Community Council. During the consultation period a Scoping Opinion was requested from the Scottish Government in order to identify the scope of, and approach to the EIA of the overhead line.

Development of the Proposed Route:

Following the consultation period and receipt of consultation and scoping responses the Preferred Route was reviewed. The review included the preparation of a technical line design. This was then adopted as the Proposed Overhead Line.

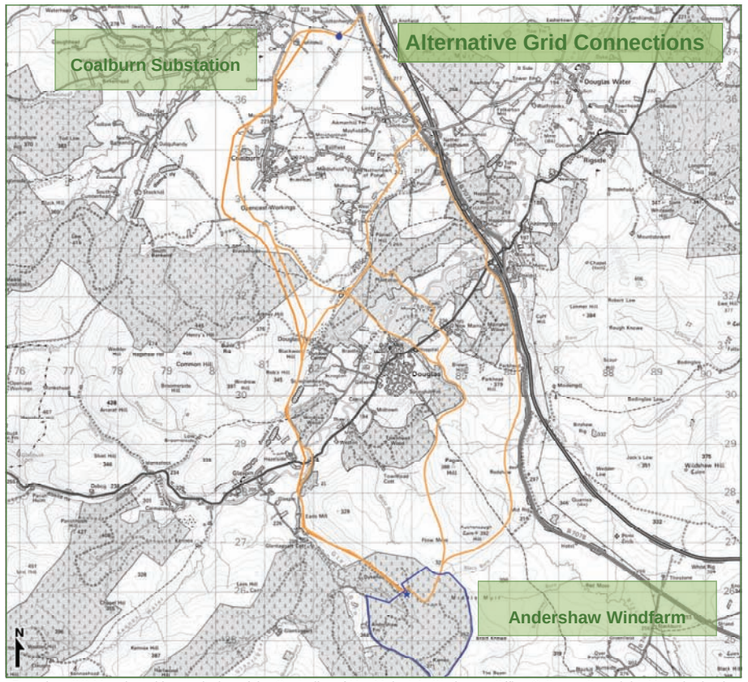
EIA of the Proposed Route:

An EIA of the Proposed Overhead Line was then undertaken in support of the Section 37 application.

During the routeing study a number of constraints and opportunities were identified including areas and designated sites which were to be avoided and existing wayleaves through woodland which could be used. Alternative routes that were considered in the development of the scheme are illustrated opposite.

2.2 Proposed Route

The proposed overhead line route is illustrated on the opposite page. It is approximately 15km length; of which 14.5km is carried on an overhead line with remaining section being an underground cable into Coalburn substation. The proposed connection runs in a generally northern direction from the proposed Andershaw windfarm broadly north towards the A70 and Douglas Water. It crosses the Douglas Valley north towards Hagshaw



Hill windfarm and continues through the former opencast coal mine at Dalquhandy to the west of Coalburn. The scheme crosses Muirburn and Coalburn Road and is routed north where it connects to the recently constructed substation 2km north of Coalburn.

2.3 Line Design Details

Traditionally 132kV overhead line have been carried on steel lattice towers, however, for the purposes of this grid connection wood poles have been identified as the most appropriate means of carrying the overhead line.

These have a number of advantages over steel lattice towers. Wood poles are more slender and simple in appearance and as a result can be more sympathetically routed through the rural and wooded landscape of the Douglas Valley.

The wood pole will be a double pole structure. An example of which is illustrated opposite. It measures approximately 13-16m in height from ground level to the top of the conductors.

The double pole structure is required due to the high elevations encountered along the route of the scheme. The double pole structure will provide greater rigidity against the wind speeds to which the structure will be exposed as well as provide greater protection against the potential effects of ice loading. All wood poles are fully seasoned and are treated with an appropriate preservative.

Proposed wood pole structure.

At the top of the wood poles the galvanised steelwork structure supports the insulators and three conductors. An earth wire is slung underneath the steelwork.

2.4 Construction of the Scheme

The construction of the overhead line will be timed to coincide with the construction of Andershaw windfarm. Construction will involve:

- Small scale earthworks around the base of wood pole structures including top soil stripping and excavations;
- Erection of the wood poles and backfilling of excavations;
- Stringing of the conductors; and
- Reinstatement of affected ground.

The types of plant and equipment involved in construction activities are relatively small scale and would be limited to 4x4 vehicles with trailers and an excavator. Access to construction areas would as far as possible be taken from existing roads and tracks. Where temporary access tracks are required these would be agreed with in advance with affected landowners.

Construction of the proposed overhead line connection is expected to take 60 weeks, based on a typical rate of progress of 1km of overhead line per three to four weeks.

2.5 Operation of the Scheme

Wood poles have an expected lifespan of around 40 years. Consequently once operational outside of inspection and maintenance activities will be limited. Regular inspection of exposed elements which suffer from corrosion, wear, deterioration and fatigue will be required to ensure the safety of all components is in accordance with the Electricity Safety Quality and Continuity Regulations 2002.

Coalburn Substation

Andershaw Windfarm

Route of the Proposed Overhead

3. Environmental Impact Assessment

3.1 Introduction

EIA is the process of compiling, evaluating and presenting all of the significant environmental effects of a proposed development. This is an iterative process that allows the developer to identify potential environmental effects and develop mitigation measures which aim to avoid, reduce or offset the negative impacts of the development.

The following sub-sections provide a summary of the findings of the assessment of each of the topics covered in the ES. The assessment describes negative and positive effects on a rising scale, typically none, minor, moderate or major.

KEY TO IMPACTS

Major: These are highly significant impacts because of their large scale and/or the importance of the area affected.

Moderate: These are significant impacts because of their scale and/or the importance of the area affected.

Minor: While noticeable these impacts are not significant.

None: Impacts rated as none result in no detectable change to the environment.

3.2 Planning Policy Context

The application to construct and operate the proposed overhead line will be made to the Scottish Ministers under Section 37 of the Electricity Act 1989. The Ministers will consider the Section 37 application in the context of a range of policies at national, regional and local level including National Planning Policy Guidance (NPPGs), Scottish Planning Policies (SPPs), the Glasgow and Clyde Valley Joint Structure Plan and the South Lanarkshire Local Plan (finalised 2006). Policies that will be particularly pertinent include those which relate to the protection of the built and natural environment as well as others relating to the development of renewable energy schemes.

3.3 Land Use, Access & Recreation

Current and potential future land use within the study area has been established through site surveys and a review of maps, aerial photographs and current planning applications.

The predominant land uses within 250m of the proposed overhead line are related with agriculture and commercial forestry. Agricultural use tends to be limited to rough grazing particularly on upland and moorland areas whilst on the lower valley slopes improved arable land is present. In the wider area opencast coal mining and associated activities are dominant; three active mines are present (Glentaggart, Broken Cross and Poniel) with a fourth proposed at Mainshill Wood.

The proposed overhead line directly crosses six of the identified land use categories including commercial plantation, land used for rough grazing, improved agricultural land and the former opencast site at Dalquhandy.

A key element in mitigating potentially negative effects on land use has been to avoid routeing over those areas identified as being particularly sensitive or valuable. However, the primary effects on land use relating to the land take associated with the proposed overhead line are unavoidable. In addition, there could also be a potential reduction to land use functions resulting from temporary severance or reduction in access. The landtake, particularly once the overhead line is operational, is minimal. In order to ensure construction impacts are reduced, working areas will be minimised and access maintained as far as practicable. Impacts on existing land use have been assessed as Minor Adverse and are therefore **Not Significant**.

The land use assessment also considered the effects of tree removal within commercial plantation. The proposed overhead line will require widening of existing wayleaves in mature plantation and creation of wayleaves in recently planted areas. The precise areas to be felled would be determined prior to construction, however, it is estimated up to 12ha of plantation would require to be felled or lopped. In the context of the existing plantation coverage in the area this is a negligible amount. Windthrow risk within the identified wayleaves will be assessed where appropriate and mitigation measures implemented, therefore impacts are assessed as being Minor Adverse and therefore **Not Significant**.

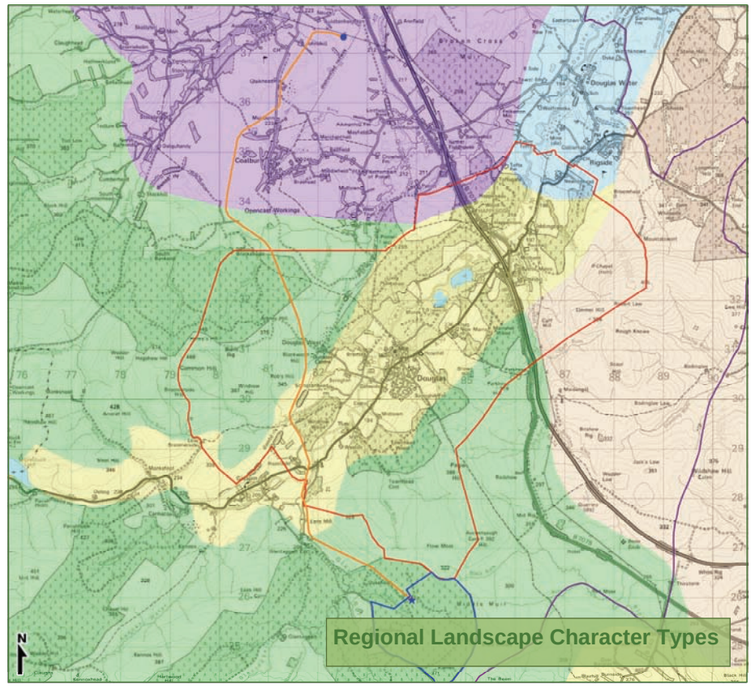
3.4 Landscape & Visual Amenity

The landscape within the study area has undergone intensive modification by opencast coal mining, renewable energy development, forestry and agricultural activities. It is also crossed by a network of transmission and distribution overhead lines strung on wood poles and higher voltage lines on large steel lattice towers. The range and form of development have altered the landscape to varying degrees and resulted in a decline in landscape quality and condition in some areas.

However, there are also some valued and higher quality landscapes within the study area. The scheme is routed within 1.5km of the Southern Uplands Regional Scenic Area (RSA) and crosses through the western part of Douglas Area of Great Landscape Value (AGLV). There are no national landscape designations such as National Scenic Areas or Registered Historic Parks and Gardens within the study area.

The proposed overhead line would pass through three Regional Landscape Character Types as identified in the Glasgow and Clyde Valley Landscape Character Assessment; Plateau Moorland (green), Plateau Farmland (purple) and Upland River Valley (yellow). However, given the relatively small extents of the study area and the scale of proposed scheme, eight local landscape character areas, which provide a more detailed landscape resource baseline have also been identified. These are:

- Upland Moorland with Commercial Forestry;
- Upland Moorland;
- Opencast Mining;
- Restored Opencast Mining;
- River Valley Pasture;
- Upland Moorland with Windfarm
- Lowland Moorland; and
- Undulating Pasture.



With regard to impacts on landscape designations the proposed overhead line would not result in any significant effects on the Southern Uplands RSA. Where the scheme crosses the floor of the Douglas Valley within the AGLV there would be a Significant impact on a limited area. However, overall effects on the AGLV are considered to be **Not Significant**.

Significant impacts on landscape character are predicted on the following landscape character types and area:

- Upland River Valley LCT;
- River Valley Pasture LLCA ;and
- Undulating Pasture LLCA

Impacts on the Upland River Valley LCT and River Valley Pasture LLCA are confined to the same area of the Douglas Valley where it is spanned by the proposed overhead line.

As part of the visual assessment, a Zone of Theoretical Visibility (ZTV) has been produced. The ZTV illustrates the areas, based on elevation and the height of the wood pole, where the overhead line would be visible from. It indicates that the scheme would theoretically be visibility across most areas within 2-3km of the scheme, however, beyond 5km theoretical visibility would become more fragmented and dispersed.

Visibility would be restricted by a combination of conifer plantation, deciduous woodlands and hedgerow vegetation throughout the study area. Buildings, landform and local variations in topography would also limit visibility of the overhead line. Actual visibility of the scheme would therefore be less than that illustrated by the ZTV.

The visual assessment considered the effects of the overhead line from ten viewpoints identified as being representative of the scheme. The assessment concluded that there would be **Significant** impacts upon three viewpoints at the following locations:

- Earl's Mill (illustrated below);
- A70 near Hazelside; and
- Muirburn immediately north of Coalburn.

The route of the proposed transmission line was selected based on the results of an options study which examined the environmental and land use constraints present between Andershaw and Coalburn. Landscape and visual interests were two of the primary environmental constraints that influenced the selection of the preferred route and the development of the proposed overhead line route. The routeing study was therefore the principal means by which the permanent and operational effects of the overhead line have been mitigated. Whilst the scheme will give rise to some adverse impacts it is considered to result in the least damaging impacts when compared to alternatives examined as part of the routeing study.

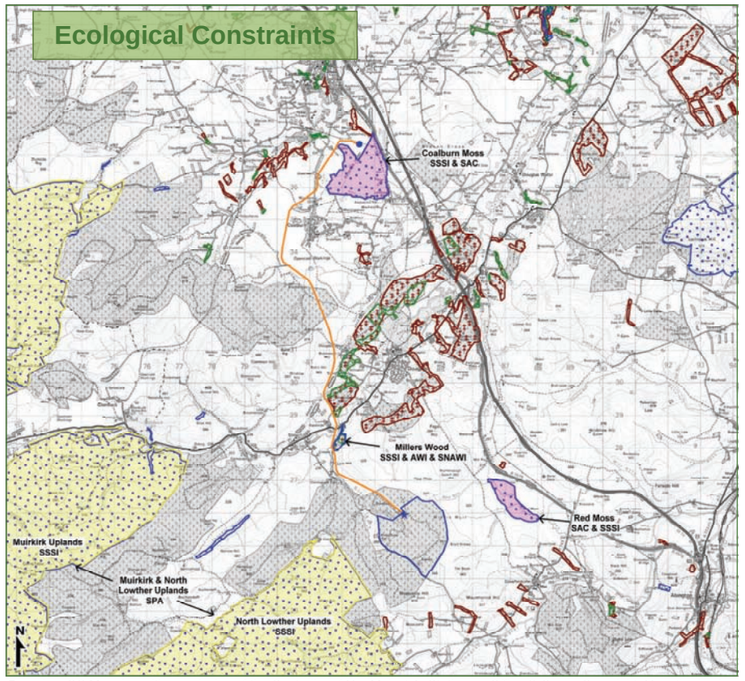
Routeing of the line has sought to achieve the best fit with the landscape using landform and vegetation whilst recognising the engineering and technical constraints of the construction and operation of an overhead line. Micrositing of wood poles could further reduce impacts of the scheme by ensuring that structures are placed where they would not cause unnecessary detrimental effects.

The landscape and visual impact assessment indicates that there would be significant adverse impacts upon the landscape of some parts of the study area and the Douglas Water AGLV would be affected to a degree. There would also be significant adverse effects on the visual amenity afforded from some locations. However it is considered that the visual amenity of the study area in general would not deteriorate to a significant degree and the overall impact upon the population of the study area is therefore limited.

3.5 Ecology & Nature Conservation

Baseline ecological conditions with respect to flora and fauna have been identified through a combination of desk study and field surveys. The baseline survey and consultations identified the following ecological receptors that could potentially be affected by the proposed overhead line:

- **Designated sites**: Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI), Ancient Woodland Inventory (AWI) and Semi-Natural Ancient Woodland Inventory (SNAWI);
- **Habitats and notable flora**: Semi-natural woodlands, unimproved acid and base rich grassland, mires and bryophyte dominated springs and flushes; and
- **Protected species**: Otters, water voles, badgers and bat species.



Photomontage view of the proposed overhead line at Earl's Mill.

Photomontage view of the proposed overhead line on the dismantled railway below Hagshaw Hill windfarm.

The proposed overhead line avoids directly crossing all statutory and non statutory designates sites. Coalburn Moss SAC and SSSI, Millers Wood SSSI and Windrow Wood AWI and SNAWI are the closest the closest designated sites to the scheme. Coalburn Moss is particularly sensitive to indirect impacts as it is a water dependant terrestrial ecosystem, however given the distance between it and the overhead line it will not be detrimentally impacted on. Millers Wood and Windrow Wood will by also be unaffected by construction of the overhead lines as no tree felling will be required at either site. Impacts on protected sites are therefore **Not Significant**.

Habitats and notable flora are not predicted to be significantly affected by the overhead line due to the small area of land take required for the wood poles and the limited areas of botanical importance or interest affected. Within sensitive areas it is recommended that an ecologist is present on site during construction to advise on micrositing wood poles and/or temporary access routes. Given the small footprint of the wood poles the area of habitat/flora affected is considered to be minimal and effects are therefore **Not Significant**.

Ecological surveys were undertaken along the proposed route of the overhead line. No otter holts, water vole burrows, badger setts or bat roosts were identified during the survey period, however, badgers were found to be present in the area, otters are using watercourses spanned by the scheme and scattered broadleaf trees in the vicinity of the overhead line route carry medium bat roosting potential.

Potential impacts on otters, water voles, badgers and bats have been identified as **Not Significant**, however, pre-construction surveys and checks will be required to be undertaken prior to construction. These will seek to establish any change to the baseline conditions in the intervening period and will identify where construction areas, access routes and micrositing of wood poles may be necessary.

3.6 Ornithology

The existing ornithological interests within the area have been established through consultation and field surveys for both breeding birds and wintering birds.

Sites designated for their bird interests are present within the area. At its closest point the proposed overhead line is within 2km of the Muirkirk and North Lowther Uplands Special Protection Area (SPA). This regularly supports breeding populations of European importance of Annex 1 species including Golden Plover, Hen Harrier and Merlin.

Field surveys undertaken include Breeding Bird Surveys (Bibby et al., 2000 and Brown and Shepherd 1993). Species identified during the breeding surveys included hen harriers, curlew, snipe and lapwing.

Wintering Bird Surveys (Survey Methods for Use in Assessment of the Impacts of Proposed Onshore Wind Farms on Bird Communities (SNH, 2005)). During the wintering bird surveys species including golden plover, merlin and hen harrier and peregrine were identified.

Results of field surveys were supplemented with information from various groups including the British Trust for Ornithology and the South Strathclyde Raptor Study Group.

With respect to breeding bird species the potential impacts primarily relate to construction, in particular the timing of it. A pre-construction survey will be undertaken to identify the presence of breeding bird species. As much as possible construction works will take place outwith the breeding season (March to August). Where this is not possible a suitably qualified ecologist will advise on appropriate working areas and methods. Where Schedule 1 Species are known to breeding construction activities will be programmed to avoid working within their vicinity. Taking into account mitigation both construction and operation impacts on breeding birds are considered to be at worst Minor Adverse and are therefore **Not Significant**.

Wintering birds have the potential to be impacted on during the construction period and once the overhead line is operational. Three types of impact could result disturbance, displacement or collision.

Both disturbance and displacement are predicted to create temporary Minor Adverse impacts on wintering birds in vicinity of construction works. Operational impacts are restricted to collision. There is a risk that birds could collide with wood poles and conductor wires, however, the design of the wood pole structures has sought to minimise this risk. Wintering bird surveys have been undertaken and the collision risk is considered to minimal. Should pre-construction surveys or post construction monitoring indicate that there is an increased risk of collision bird diverters or flappers would be attached to overhead lines where appropriate. Collision effects are considered to be Minor Adverse and are therefore **Not Significant**.

3.7 Cultural Heritage & Archaeology

The proposed overhead line is routed through an area which, although of some archaeological and historic interest, contains sites that are of low or negligible heritage value. Twelve sites of interest could be impacted upon during construction of the proposal, however, it is possible that these sites have already been removed or lost particularly in active or former opencast coal mines and in areas of commercial plantation. Where known archaeological or heritage features are present wood pole structures will be microsited to avoid such interests. The span of the wood pole structures, typically 60 – 80m, will mean that some features are spanned by the overhead line and avoided. Where sites are affected, an archaeological watching brief will be maintained during construction heritage features affected would be recorded. The impact on each of the twelve sites is assessed in the worst case as Minor Adverse and **Not Significant**. Even when considered in cumulative terms, the direct physical effect on the cultural heritage resource is not considered significant.

In the long term the proposals will have no direct or indirect physical impacts on cultural heritage resources. Through the routeing of the overhead line it has been possible to avoid impacting on Scheduled Monuments, such as that at Auchensaugh Hill, and the listed buildings comprising the Douglas Conservation Area. The grid connection will have a negligible impact upon the historic setting of individual sites, and on the

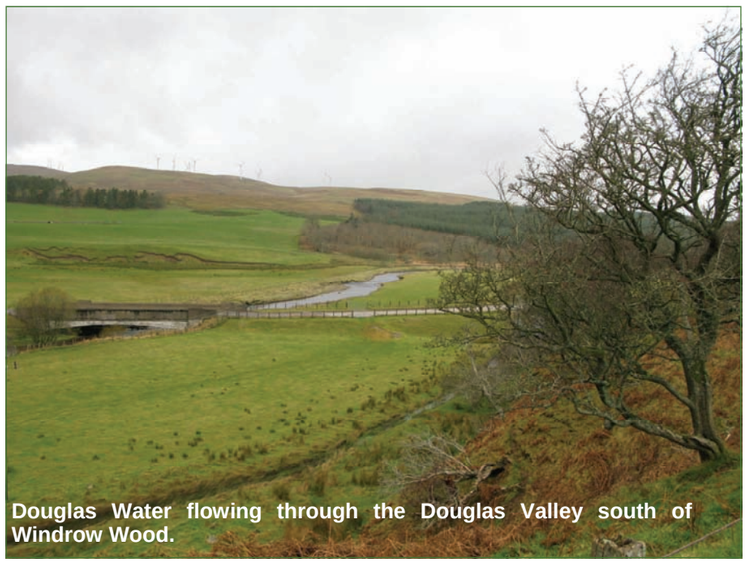
historic landscape as a whole. Overall permanent effects on cultural heritage and archaeology are therefore **Not Significant**.

3.8 Ground Conditions & the Water Environment

The prevailing ground conditions, geology and soils, exert a considerable influence over the landscape of the area as well as land use. The geology of the region comprises a number of coal seams some of which have been extensively worked. The majority of the soils are poorly draining and seasonally waterlogged and include blanket peat, peaty gleys and non-calcareous gleys. This restricts the agricultural capability of the land, particularly in upland areas where rough grazing is prevalent.

The principal watercourse within the study area is the Douglas Water which flows generally north east through the Douglas Valley. The overhead line will span this watercourse and is routed over and close to some of its tributaries including the Glespin Burn. The majority of watercourses along the scheme are small burns draining the upland areas or drains located on agricultural land. Water quality is monitored in the Douglas Water and the Glespin Burn and is classified by SEPA as “Good” and “Excellent” respectively. The SEPA Flood Risk map for Scotland has been reviewed as section of the Douglas Water where it meets the Glespin Burn are identified as being susceptible to flooding.

The solid and drift geology underlying the overhead line is considered to be of very low sensitivity to this form of development, however, economically important coal seams are present in the wider area. In designing the route of the overhead line consultation was undertaken with Scottish Coal so that areas containing economically important coal deposits could be identified and avoided. Impacts on soils are limited to disturbance of the land and the permanent footprint of the wood poles. In order to ensure no long lasting impacts on soils all land affected during construction will be reinstated. There will be a permanent loss of a small amount of soils but this is considered to be negligible. Consequently impacts on ground conditions are considered to be **Not Significant**.



Douglas Water flowing through the Douglas Valley south of Windrow Wood.

Potential impacts on the water environment relate mainly to reductions in surface or groundwater quality during construction. Whilst the overhead line spans or is routed close to a number of watercourses wood poles will be located so that during construction and operation the risk of polluting watercourses is reduced. The risk of pollution will be further mitigated through careful working practices and adherence to Pollution Prevention Guidelines (PPGs). Impacts would be Minor Adverse and **Not Significant**.

In the long term the impacts of the wood poles on surface water runoff and flood risk are, due to the minimal foot print of the wood poles, considered to be **Not Significant**.

3.9 Mitigation

A standard hierarchical approach to identifying mitigation, summarised below, has been used to address the potentially significant adverse effects that the proposed overhead line may have on the environment.

APPROACH TO MITIGATION

AVOID:

In the first instance, mitigation should seek to avoid the adverse effect at source for example, by locating the scheme away from a sensitive receptor.

REDUCE:

If the effect is unavoidable, mitigation should seek to reduce the significance of the impact.

OFFSET:

If the effect can neither be avoided nor reduced, mitigation should seek to offset the impact through the implementation of compensatory mitigation.

Through the development of the overhead line it has been possible to avoid or prevent a number of potential environmental impacts occurring from the outset. This approach to developing the route and design of the proposed overhead line is in itself the important form of mitigation. It has been through the routeing process that it has been possible to develop a grid connection that avoids designated sites as well as landscapes and other areas considered to be sensitive to the development of an overhead line. Similarly in designing the proposed overhead line the selection of the wood pole model instead of a traditional steel tower is a key component of the project’s mitigation. The wood pole structures are smaller in scale and can be routed more sympathetically through the rural area using landform and vegetation to reduce the scheme’s impacts.

Through the EIA process further mitigation measures have been identified which have informed the overhead line design and which will underpin the construction of the scheme.

A detailed schedule of the mitigation measures that have informed the design of the scheme and that will be implemented prior to, during and post construction is contained within the Environmental Statement. All aspects of construction of the scheme would be in accordance with relevant legislation and best practice. Key mitigation measures include:

- The preparation of an Environmental Management Plan (EMP) which will identify all the mitigation measures to implemented as part of the project.
- The preparation of Construction Method Statement which will describe the activities to be undertaken including soil stripping, vegetation removal, excavations and land reinstatement.
- Prior to construction commencing ecological surveys will be undertaken to ensure that there has been no change to the baseline conditions. These will also, where appropriate, inform the locations of construction areas, access routes and the micrositing of wood poles.
- Training of construction staff on the requirements of the EMP and highlighting sensitive areas along and adjacent to the overhead line.
- Construction programming to take account of sensitive seasonal constraints as much as possible.
- Minimising working areas in order to reduce the disturbance of land, flora and fauna
- Use of excess soils from excavations around wood poles in the reinstatement, to an adequate level, of all affected land.
- Adherence to best practice guidance to control and manage the risk of pollution including the development of temporary drainage measures based on Sustainable Urban Drainage Systems (SUDS) techniques.

4. Summary & Conclusions

4.1 Summary of EIA Results

In accordance with their duties as the Transmission Licence holder, SPT has developed an overhead line that, on balance, results in a minimal environmental impact but which is also is technically and economically feasible. The results of the EIA are summarised below:

Discipline	Does the Proposed Overhead Line result in Significant Environmental Impacts ?	
	Construction	Operation
Land Use, Access & Recreation	No	No
Landscape & Visual Amenity	No	**Yes**
Ecology & Nature Conservation	No	No
Ornithology	No	No
Cultural Heritage & Archaeology	No	No
Ground Conditions & the Water Environment	No	No

Generally the scheme has, on balance, a minimal impact. Sensitive routeing and design as well as careful and considerate construction mean that the majority of environmental impacts can be successfully avoided or mitigated and consequently will not be significant.

However, it is recognised that landscape and visual impacts are inherent with development of this type and whilst the overhead line design has sought to achieve best fit within the landscape and minimise visual impacts, limited significant effects, particularly where the scheme crosses the Douglas Valley, are predicted. Due to its location at the centre of the study area, impacts on the Douglas Valley AGLV have been unavoidable. Diverting the route to the east or west would require a significant increase in the length of the route. In the case of diverting to the east, the route would be much closer to populated areas at Rigside whilst to the west it would bring route in much closer proximity to the Muirkirk and Lowther Uplands SPA. To reduce the impact on the AGLV the proposed route is located on the AGLV's western margins avoiding the more sensitive areas north of Douglas. The area in which significant effects on landscape and visual resources are predicted to occur is confined to a limited section of the Douglas Valley south of Hazelside where the proposed overhead line spans the A70 and is routed north up the Douglas Valley. Whilst in this locality the effects are considered to be significant, in the context of the area as a whole the grid connection is not predicted to result in an overall deterioration in visual amenity.

4.2 SPT's Statutory Duties

As stated at the outset SPT are obliged by the terms of their transmission licence "to develop and maintain an efficient, co-ordinated and economical system of electricity transmission" whilst also complying with their responsibilities to the natural environment as set out in Schedule 9 of the Electricity Act 1989.

Given the limited number and localised nature of the significant environmental effects predicted to result from the construction and operation of the proposed 132kV grid connection between Andershaw windfarm and Coalburn substation SPT have fulfilled their statutory licence obligations. That is to say, the proposed grid connection is:

- Technically feasible;
- Economically viable; and
- Causes minimum disturbance to people and the environment.

Andershaw to Coalburn 132kV Overhead Line
Volume 2: Environmental Statement

FABER MAUNSELL | AECOM

SP TRANSMISSION

1. Introduction

1.1 Introduction

This Environmental Statement (ES) has been prepared in support of the Section 37 application (under the Electricity Act 1989) to the Scottish Ministers to construct and operate a 132kV overhead line between the proposed Andershaw windfarm and Coalburn substation in South Lanarkshire, Scotland.

The ES reports on the findings of an Environmental Impact Assessment (EIA) of the connection scheme and has been prepared following the requirements set out in the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000.

1.2 Background

Project Need

In order to reduce carbon dioxide emissions and in pursuit of more sustainable sources of electricity, the UK and Scottish Governments have set ambitious targets for renewable electricity production. As a result an increasing number of renewable energy developments, in particular windfarms are being proposed.

Catamount Energy Limited and Force 9 Energy are jointly developing a 14 turbine windfarm, Andershaw windfarm, approximately 4km south of Douglas in South Lanarkshire. As part of the windfarm project, the developers require the proposed windfarm to be connected to the electricity transmission grid.

Consequently the windfarm developers applied to Scottish Power Transmission Ltd (SPT), the Transmission Licence holder for the south of Scotland, for a connection to the high voltage electricity transmission system. As the Transmission Licence holder, SPT is obliged under the Electricity Act 1989:

"to develop and maintain an efficient, co-ordinated and economical system of electricity transmission".

As well as being required to provide Andershaw windfarm with a grid connection, Schedule 9 of the Electricity Act 1989 requires SPT to take account of the following when planning new overhead line developments:

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

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

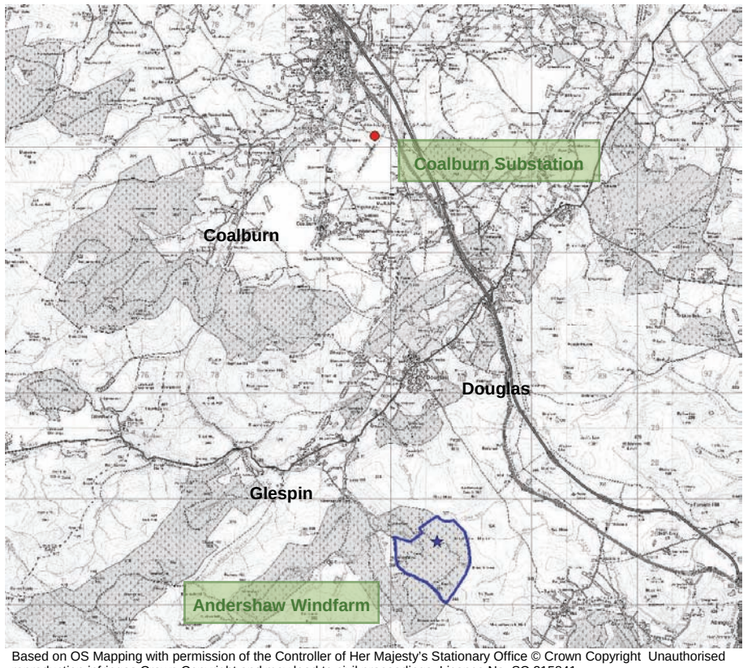
With these obligations in mind SPT has sought to develop a grid connection which balances technical and economic considerations with environmental issues.

Project Overview

SPT has identified that a grid connection is best achieved through the development of a new 132kV overhead line between Andershaw windfarm and Coalburn substation. The overhead line proposed by SPT is a single circuit connection carried on wood pole structures.

Prior to the undertaking of the EIA and in line with SPT's obligations to consider the environmental effects of their projects, a comprehensive route selection study was undertaken. The study focused on identifying the environmental, technical and economic constraints to the routeing of overhead lines in the area illustrated below.

Figure 1.1 Study Area Overview



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Based on the routeing study a proposed route has been identified. Further information on the proposed route, the design of the overhead line and the alternatives considered are contained within Chapter 2 of this ES.

1.3 Consents Required for the Scheme

SPT are seeking consent to construct and operate the 132kV grid connection under Section 37 of the Electricity Act 1989. Additionally SPT are seeking that the Scottish Ministers issue a direction under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997 that deemed planning permission be granted for the overhead line and ancillary development including the section of underground cabling.

Andershaw Windfarm including its substation is subject to a separate EIA and planning application.

1.4 EIA of the Scheme

In accordance with the Electricity Act 1989, SPT intends to submit a Section 37 application to construct and operate the Andershaw windfarm to Coalburn substation 132kV transmission line. Section 37 applications for consent to install or keep installed an electric line above ground fall under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000.

The proposed overhead line is a Schedule 2 development, for which EIAs are not mandatory. In determining the requirement to undertake an EIA, the potential for the scheme to result in significant environmental effects must be considered and if appropriate a Screening Opinion as to the need for EIA can be requested from the Scottish Government.

However, a Screening Opinion was not requested and EIA has been undertaken. SPT, mindful of their responsibilities to people and the environment, as well as their statutory duties; consider it appropriate to undertake an EIA for this overhead line development. This document, the Environmental Statement (ES), summarises the findings of the EIA and is required to be submitted with the Section 37 application.

1.5 The EIA Process

EIA is the process of compiling, evaluating and presenting all of the significant environmental impacts of a proposed development. The assessment is designed to help produce an environmentally sympathetic project by detecting potentially significant adverse environmental impacts early in the design process, thus leading to the identification and incorporation of appropriate mitigation measures into the final scheme design. The main steps in the assessment procedure can be summarised as follows:

- Examine the environmental character of the area likely to be affected by the development through baseline studies;
- Predict the possible effects on the environment, both beneficial and adverse, of the development;
- Introduce design and operational modifications or other measures to avoid, reduce or offset adverse effects, and where possible, enhance positive effects; and
- Summarise the results of the EIA in the ES. A Non-Technical Summary of the ES is also produced.

A detailed explanation of the approach to undertaking the EIA and producing the ES is set out in Chapter 3.

1.6 Environmental Statement Authors

The ES has been prepared in its entirety by Faber Maunsell. Photomontages and renders, which accompany the Landscape and Visual assessment (Chapter 7), have been prepared by our sister company EDAW. Table 1.1 provides details of the key project team members and contains a brief summary of their experience.

Where required, technical advice relating to the design, construction and operation of the overhead line has been provided by SPT.

Table 1.1 Summary of Key Project Team Members

Staff	Team Role	Chapter Input	Experience
Iain Bell	EIA Project Director	Review	Iain Bell has over 14 years experience in environmental consultancy, specialising in land use planning and the management of multi-disciplinary EIAs and SEAs.
David Ritchie	EIA Project Manager	1-6, 11 & 12	David has over 4 years experience of undertaking and managing EIAs. Responsible for the preparation of Ground Condition and Water Environment chapters for a number of projects including windfarms, overhead lines, hydroelectric schemes and mixed use developments.
Ruth Kirby	Landscape Architect	7	Ruth Kirby is a chartered landscape architect and environmental scientist with over 10 years experience. Possesses a wide range of experience in EIA including landscape visual assessment of overhead lines and hydroelectric schemes and mixed use developments.
Melanie Findlay	Ecologist	8	Mel is an ecologist with over 15 years experience. Specialist in flora and fauna surveys and has provided ecological input to a number of EIAs including windfarms, opencast coal mines and major road schemes.
Victoria Bennett	Ecologist	8	Victoria is an environmental scientist with a background in ecology. She has experience in a wide range of ecological faunal surveying techniques and provided input to EIAs of mixed use developments and transport schemes.
Stephen Dixon	Ecologist	9	Stephen is a highly competent ornithologist with excellent bird identification skills. He possesses over 15 years experience of undertaking bird surveys as part of EIAs of windfarms and major transport schemes.
Brian Sutton	Ecologist	9	Brian is an ecologist with range of experience including breeding and wintering bird surveys. This has included bird surveys for EIAs of overhead line developments in Scotland and Ireland.
Helen Maclean	Archaeologist	10	Helen is an archaeologist with over 10 years experience. She undertaken archaeological assessments for EIAs of roads schemes, overhead line projects and wind farms.

1.7 Structure of the Environmental Statement

The assessment described in this ES relates to the design of the scheme as submitted to the Scottish Government in April 2009. The ES is published as a single document comprising three volumes:

- **Volume 1** Non-Technical Summary;
- **Volume 2** Environmental Statement: Main Report; and
- **Volume 3** Appendices to the Main Report.

A summary of the ES is provided in Volume 1, the Non-Technical Summary (NTS). This is intended to be readily accessible to the general public. It is concise and written in non-technical language providing a description of the proposal, a summary of the environmental effects and proposed mitigation measures.

Volume 2 is structured around the following chapter headings:

Chapter 1. Introduction
Chapter 2. Development of the Scheme and Alternatives
Chapter 3. Scheme Description
Chapter 4. Approach to EIA
Chapter 5. Policy Context
Chapter 6. Land Use and Recreation
Chapter 7. Landscape and Visual Amenity
Chapter 8. Ecology and Nature Conservation
Chapter 9. Ornithology
Chapter 10. Cultural Heritage and Archaeology
Chapter 11. Ground Conditions and Water Environment
Chapter 12. Summary of Assessment & Mitigation Requirements
Chapter 13. Schedule of Mitigation Measures

Volume 3 includes all Appendices and supporting information cross-referenced from Volume 2.

1.8 Availability of the Environmental Statement

Further copies of the ES are available from:

SP Energy Networks
Environmental Planning
3 Prenton Way
Prenton
Merseyside
CH43 3ET
Tel: 0151 609 2568

Copies of the Environmental Statement may be obtained from SP Transmission (tel: 0151 609 2568) at a charge of £120 for a hard copy and £10 for a DVD. Copies of a short standalone Non-Technical Summary are available free of charge (not including Postage and Packaging). Copies of the documents will be available for public viewing at the following locations:

Council Offices:

South Lanarkshire Council
Clydesdale Planning and Building Standards area office
South Vennel
Lanark
ML11 7JT

Libraries:

Lanark Library
16 Hope Street
Lanark
ML11 7LZ

Lesmahagow Library
48 Abbeygreen
Lesmahagow
ML11 0EF

Other locations:

St Brides Hall
Braehead
Douglas
ML11 0QW

Any representations to the application should be made by completing the online representation form on the Scottish Government, Energy Consents website at:

http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-Consents/Support-object

Or by email to The Scottish Government, Energy Consents Unit mailbox at:

energyconsents@scotland.gsi.gov.uk

Or by post to:

The Scottish Government,
Energy Consents Unit,
2nd Floor,
Meridian Court,
5 Cadogan Street,
Glasgow,
G2 6AT

Representations should be dated and should clearly state the name (in block capitals) and full return email or postal address of those making representation. All representations to the Scottish Government will be copied in full to the planning authority, and made available to the public on request, unless individuals request otherwise.

2. Development of the Scheme and Alternatives

2.1 Introduction

The proposed overhead line connection between Andershaw windfarm and Coalburn substation was identified following a detailed routeing study which considered the environmental, technical and economic constraints to overhead line development within the area.

This chapter provides a summary of how the proposed Andershaw windfarm to Coalburn substation grid connection scheme has been developed and provides a summary of the alternative routes and forms of connection that have been considered.

2.2 Routeing Study

Overview

The results of the routeing study were reported in a Consultation Document. This was published in June 2008 with the intention of allowing statutory and non-statutory consultees the opportunity to understand how the preferred connection was identified.

The routeing study considered the environmental, technical and economic constraints to the scheme and how a connection could be provided. The overall aim was to identify a preferred grid connection which balanced technical feasibility and economic viability whilst ensuring the least disturbance to people and the environment.

The routeing study considered connections to Coalburn substation from two proposed windfarms, Andershaw and Limmer Hill. This included consideration of single connections and, due to the geographic proximity of the two proposed windfarms, combined connections.

In the course of the EIA the Limmer Hill windfarm proposal was withdrawn. As a result the connection agreement with SPT was cancelled as no grid connection is required.

Methodology

The methods employed in identifying the preferred option were based on the Holford Rules; well established guidance for option selection process for electricity infrastructure. The basic premise of the Rules is that the visual impacts of an overhead line can be reduced through sensitive routeing. The Rules are described in Table 2.1.

Table 2.1 The Holford Rules

Rule 1	Avoid, altogether if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.
Rule 2	Avoid smaller areas of high amenity value or scientific interest by deviation; provided that this can be done without using too many angle towers, i.e. the more massive structures which are used when lines change direction.
Rule 3	Other things being equal, choose the most direct line, with no sharp changes of direction and thus with few angle towers.
Rule 4	Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible, and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.
Rule 5	Prefer moderately open valleys with woods where the apparent height of the towers will be reduced, and views of the line will be broken by trees.
Rule 6	In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concatenation or 'wirescape'.
Rule 7	Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreation land intervenes between the approach line and the substation, go carefully into the comparative costs of undergrounding, for lines other than those of the highest voltage.

Subsequent reviews of the Holford Rules have been undertaken by National Grid (NG) with supplementary notes added by Scottish Hydro Electric Transmission Ltd (SHETL) to reflect Scottish circumstances. Appendix A contains NG's supplementary notes on interpreting the Holford Rules along with guidance produced by the Forestry Commission. This guidance is contained within Appendix A.

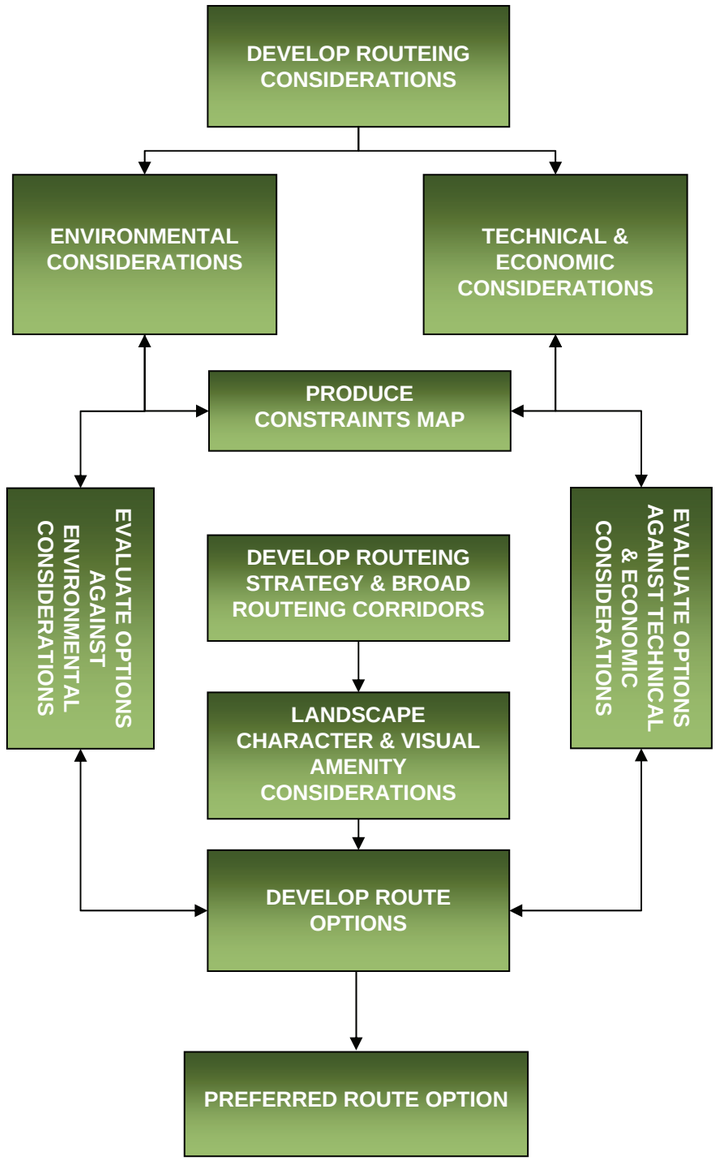
The routeing study has sought to develop routes for the grid connection that:

- Minimise potential landscape and visual impacts;
- Avoid of sites designated for ecological, cultural heritage or amenity value; and
- Ensure that the route does not compromise existing or future land use.

As set out in the Electricity Act 1989, SPT has a duty to develop an economic and efficient electricity transmission network. In order to ensure these duties are addressed SPT has advised on technical and economic factors relating to the construction and operation of the grid network and these have been balanced against environmental constraints and considerations.

The routeing methodology is illustrated in Figure 2.1 opposite.

Figure 2.1 Routeing Study Methodology



2.3 Alternatives Considered

Alternative Routes

When the routeing study was undertaken, two windfarms within the area required a grid connection; Andershaw and Limmer Hill. As a result, the study considered every possible approach to Coalburn Substation including individual connections for each windfarm, and due to the proximity of the two windfarms, potential combined route options.

Taking into account the environmental constraints, potential routeing corridors were identified and a high level assessment of these options undertaken. A number of the corridors were rejected on the grounds of landscape and visual impacts, as well as technical feasibility.

Following this, a number of overhead line route options including individual and combined connections were developed and considered in detail. These options considered various approaches to Coalburn substation including from the west adjacent to Coalburn Road, from the south along the B7078 and from the east crossing the M74.

Since publication of the Consultation Document, the developers of the proposed Limmer Hill windfarm have withdrawn their proposal. As a result, the connection agreement with SPT was cancelled and so, only alternative routes for the proposed Andershaw windfarm are discussed within the ES. These are described and illustrated in Table 2.2. Detailed annotated maps illustrating the route options are contained within Appendix B.

Undergrounding the Connection

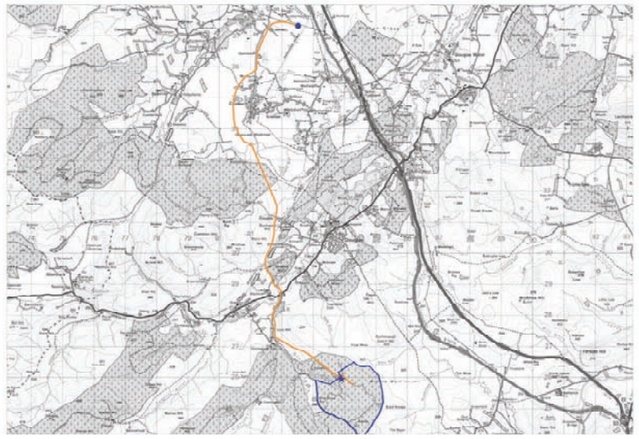
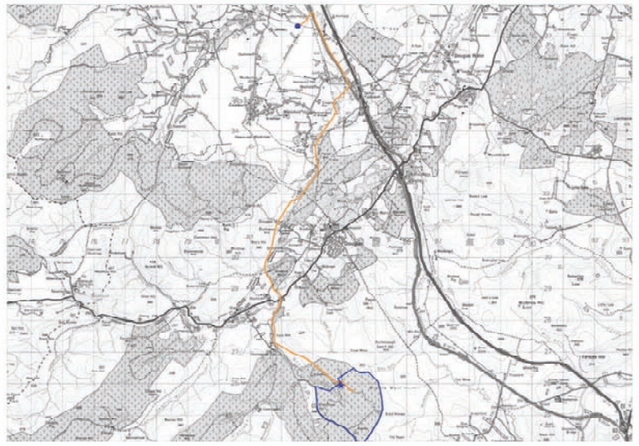
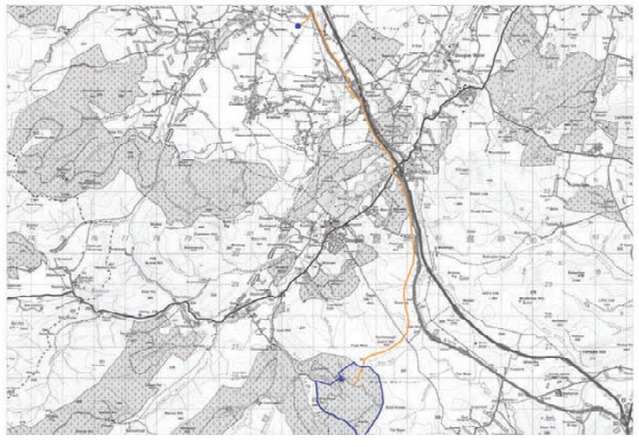
SPT's transmission licence requires it to comply with the Electricity Act 1989. This obliges it to develop and maintain an efficient, coordinated and economical system of electricity supply whilst taking into account the environmental effects of its activities and mitigating any adverse effects.

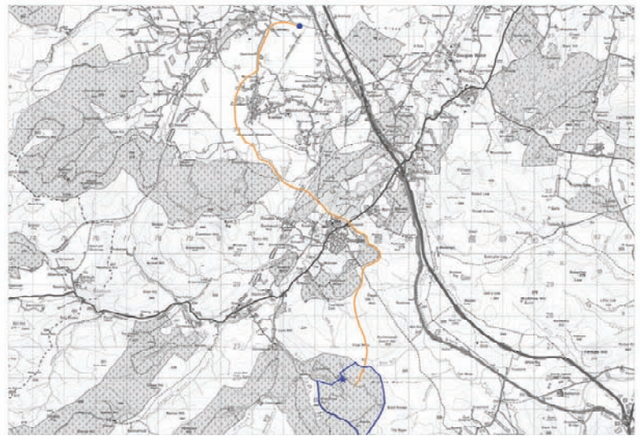
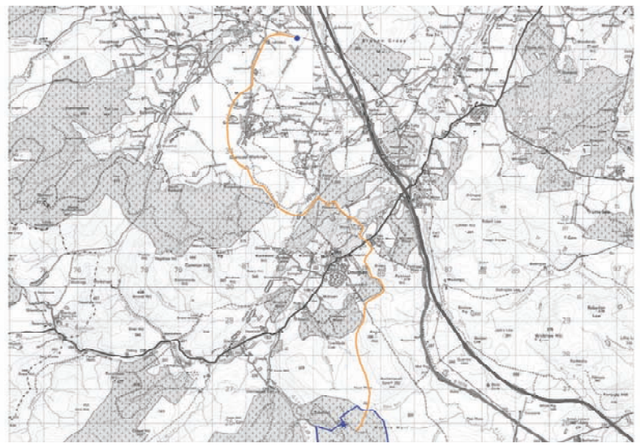
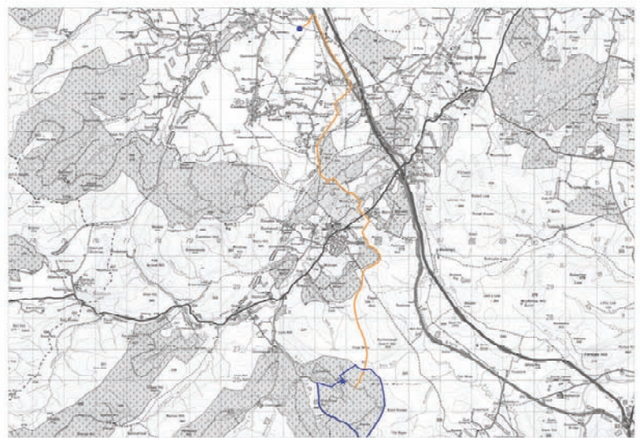
It is SPT's policy to seek to find an overhead line solution for all transmission connections and only to use underground cables where there are exceptional constraints such as areas of the highest amenity value or in built up urban areas. Where technical constraints preclude the use of an overhead line, SPT will investigate using underground cables as an alternative.

The primary advantage of underground cables as opposed to an overhead line is the reduction in the impacts on landscape character and visual amenity. Whilst there are benefits to underground cable construction there are also adverse effects which require to be considered including potential effects on ground cover, vegetation, drainage, land use, habitats and natural heritage interests.

In addition, the costs associated with underground cables are typically five to ten times higher than those associated with constructing an overhead line. These costs are dependent on a number of factors such as ground conditions and the methods required to install the underground cables.

In developing the Andershaw windfarm grid connection SPT has considered that the costs associated with developing an underground connection would be neither efficient or economical and thus would prevent the company from fulfilling its statutory duties under the Electricity Act.

Option A		Option A crosses a variety of landscapes and land use types. It is routed on the western margins of the Area of Great Landscape value (AGLV) and avoids routeing in the more sensitive sections of the Douglas Valley. The southern section of the route avoids Millers Wood SSSI and crosses the Douglas Valley in an open section. The majority of the route avoids breaking the skyline by using topography and landform. The route passes through the restored opencast coal site at Dalquhandy to the west of Coalburn and uses vegetation and landform to screen the route. This route was taken forward to further consider its technical feasibility.
Option B		Much of the route followed by Option B is a dismantled rail-way running south west to north east. The route passes through the AGLV and follows the boundary of the recently opened Poniel opencast coal mine. Around the southern section of the route it avoids Millers Wood A number of existing overhead lines, both transmission and distribution, also follow this route as it passes the Douglas West substation and crosses through the Poniel area. Around Craig End and West Toun the landscape if much more enclosed and a number of properties would have views of a wirescape caused by a multitude of overhead lines passing them. To overcome this, the technical feasibility of looking to rationalise the existing overhead lines was investigated; however, this was identified as impractical. Consequently, due to the negative effects of wirescaping this route is considered to result in significant effects on visual amenity.
Option C		Option C broadly follows the route of the B7078 northwards toward the site of Coalburn substation. This route is technically complicated due to the road junctions that it is required to cross where the A70 and B7078 meet. Within Mainshill Wood it would facilitate the felling of a significant number of trees and it also crosses an area identified in the South Lanarkshire minerals plan as holding extractable coal deposits. Further north the route is constrained along the B7078 by Coalburn Moss Special Area of Conservation/Site of Special Scientific Interest (SAC/SSSI) on the west and a number of mixed residential/commercial sites on the east. As a result of the constraints, the northern part of the route would require to be undergrounded as the required safety clearances from roads and private property are not achievable. Due to the constrained approach into Coalburn substation with private properties to the east and Coalburn Moss SAC/ SSSI to the west this route was rejected.

Option D		Option D traverses open rough grazing land before crossing the Douglas Valley and passing through Dalquhandy. Where the route crosses the Douglas Valley at the centre of the AGLV, the landscape is considered to be much more sensitive with a number of the AGLV's major features close by including Douglas Castle and the Douglas conservation area. The northern part of the routes utilises landform and vegetation to avoid impacting on landscape character and visual amenity. The approach into Coalburn substation avoids direct impacts on the SAC/SSSI. Due to the potential impacts on the landscape, in particular the features of the AGLV, this route option was considered to be unfeasible.
Option E		Where Option E crosses the Douglas Valley it would affect a landscape of higher sensitivity to change; that centred on the designed landscape of the estate at Douglas Water. Here, the composition of meandering river valley fringed by a matrix of woodland and gently sloping farmland with mature specimen tree planting creates an area of high scenic quality and forms an important part of the AGLV. North of the Douglas Valley the route is less constrained with the route making use of vegetation and landform to screen the route from potential visual receptors. Due to the sensitivity of the landscape within the Douglas Valley where this option would cross, the potential effects on landscape character and quality were considered such that this option was discarded.
Option F		Option F crosses the Douglas Valley in a similar sensitive area to Options D and E. Landscape quality within this area is high with the designed landscape forming a central component of the AGLV. Due to the sensitivity of this landscape this option was considered to be impractical.

2.4 Routeing Constraints & Opportunities

The area through which the grid connection is routed contains a variety of environmental and technical constraints. In developing potential routes avoiding designated sites and minimising landscape impacts was key, however, due to its location at the centre of the study area, impacts on the Douglas Valley AGLV have been unavoidable. Diverting the route to the east or west would require a significant increase in the length of the route. In the case of diverting to the east, the route would be much closer to populated areas at Rigside whilst to the west it would bring route in much closer proximity to the Muirkirk and Lowther Uplands SPA. To reduce potential impacts on the AGLV routes on the margins of the AGLV were identified as preferred. The central section of the AGLV was identified as major constraint which should be avoided.

During the study the use of existing wayleaves and overhead line infrastructure was investigated. The wayleave through which the coal conveyor is routed was identified as the most appropriate route exiting woodland at Andershaw as tree removal could be kept to a minimum. Along the dismantled railway and Douglas West substation there are a number of existing overhead lines, the feasibility of rationalising this infrastructure was investigated, however, it was not practical. A redundant overhead line running north from Douglas West into Dalquhandy was identified and its wayleave utilised for a section of a number of route options. The existing wayleave through the woodland can be used, again reducing the requirements for tree removal.

There are opportunities to minimise visual impacts by routeing through the restored Dalquhandy site to the west of Coalburn. Routeing to the east of Coalburn would require the overhead line to pass a number of scattered individual properties around Poniel.

Approaches into Coalburn substation from the east and west were considered. From the eastern side the route would have to follow the B7078, however, the proximity of Coalburn Moss SAC technical issues due to its close proximity to the 400kV transmission line make this approach less preferable. From the west route options can cross land to the west of Coalburn Road and use the existing vegetation to screen the majority of this section.

2.5 Preferred Option

The preferred option was initially identified in the Consultation Document as a combined route, as it comprised a spur below the M74 and over the B7078 linking Limmer Hill windfarm to Andershaw windfarm and then followed the route of Option A as illustrated in Table 2.2. Following the withdrawal of the Limmer Hill windfarm proposal and subsequent cancellation of the connection agreement with SPT, the spur linking the two windfarms was no longer required and was therefore removed.

The preferred route was slightly amended in places to take account of the views of statutory and non-statutory consultees, the altered position of Andershaw windfarm's substation as well as addressing some engineering requirements. Option A in Table 2.2 therefore shows the finalised preferred route for the overhead line. The preferred option was then adopted as the proposed development and is described in more detail in Chapter 3 of the ES.

3. Scheme Description

3.1 Introduction

This chapter summarises the main components of the connection scheme including the route to be taken by the overhead line, information on the design and appearance of the wood poles which will carry the overhead line and details of construction methods.

Note that the route differs from the preferred option that was identified in the Consultation Document and Scoping due to the request from the developers of the proposed Limmer Hill wind farm to withdraw their request for a grid connection and following amendments to take account of scoping responses and discussions with landowners.

3.2 Proposed Overhead Line Route

Description of the Study Area

The proposed grid connection is located in South Lanarkshire and runs in a generally northern direction from the proposed Andershaw windfarm to a recently constructed substation immediately north of Coalburn.

The study area is centred on the Douglas Valley with the Douglas Water flowing through it and bisecting the study area in a north east to south west direction. The M74 and B7078 also bisect the study area running in generally north west to south east. Elevations range between 200m and 350mAOD and generally fall towards the north of the area.

There are a number of scattered settlements and dwellings located within the study area including Glespin in the south, Douglas at the centre of the study area and Coalburn in the north. Within the wider area there are a number of major developments including Hagshaw Hill windfarm and Glentaggart, Poniel and Broken Cross operational opencast coal sites.

Description of the Overhead Line Route

The route of the proposed grid connection is illustrated in Figure 3.1 and described below in sections as it runs from the substation within Andershaw windfarm generally north towards Coalburn Substation. Andershaw substation is part of the windfarm planning application; it will house a transformer which steps up the voltage and connects to the overhead line.

Andershaw to Earl's Mill: From Andershaw windfarm substation the overhead line corridor runs north west within the woodland. It broadly follows the route of the coal conveyor running adjacent to the existing cleared corridor within the plantation. Exiting the woodland the overhead line corridor continues north west upslope of the conveyor until Earl's Mill.

Earl's Mill to Windrow Wood: From Earl's Mill the route runs northwards upslope of a minor road. It crosses this road south of Miller's Wood and drops down an embankment and continues north passing the confluence of the Glespin Burn and the Douglas Water and then crossing the A70. On the opposite side of the valley, the overhead line heads upslope adjacent to the boundary of Windrow Wood. Along this stretch an existing overhead line will be removed and buried to allow for the proposed 132kV overhead line to follow its wayleave.

Windrow Wood to Dalquhandy: Along Windrow Wood the proposed overhead line route follows the dismantled railway and the route of existing overhead lines. It heads approximately north east in the direction of the Douglas substation, adjacent to the entrance to Hagshaw Hill windfarm. From this location, the proposed overhead line connection will follow the wayleave of an existing redundant overhead line through plantation woodland into the former opencast coal site at Dalquhandy.

Dalquhandy to Coalburn Substation: Within Dalquhandy the overhead line follows a generally northern route towards Shoulderrig Road on the west side of Coalburn. It crosses the road in a north easterly direction across Muirburn, a flat boggy area on the fringes of the town and eventually crosses to the east of Coalburn Road. It then follows the alignment of Coalburn Road in a northern direction towards Glaikhead. From here it follows a north eastern alignment passing to the east of the derelict property at Johnshill. The overhead line then turns and heads east connecting to Coalburn substation.

Whilst the route of the proposed overhead line has been refined through the EIA process and has been the subject of a detailed technical line design, the position of the wood poles may be subject to further deviation to allow for unconfirmed ground conditions and pre-construction confirmation of environmental conditions. The proposed micrositing 'tolerance' will form part of the Section 37 Application.

3.3 Line Design Specification

Single circuit 132kV overhead lines can be supported on wood poles or on lattice steel towers. On the basis of the requirements of this particular project and the technical constraints it was considered that wood poles, which are lower in height and have a more slender and simple appearance than lattice steel towers, could be more sympathetically routed through the rural and wooded landscape of the area.

The wood pole will be a double pole structure due to the elevations the route crosses. This provides greater rigidity against the winds to which the structure will be exposed as well as providing greater protection against the potential effects of ice loading. At the top of the pole structure steelwork bracings support the conductor arrangements.

Line Design Details

In total the route is approximately 14.9km. It can be considered in two separate sections:

- A 132kV overhead line from Andershaw substation carried on wood poles for a distance of 14.5km.
- A 132kV underground cable from a terminal structure into Coalburn substation measuring 0.4km.

Typically, the wood poles are approximately 13 - 16m tall including the height of the conductors. The minimum height line of conductors above ground complies with the Electricity Safety Quality and Continuity Regulations 2002. Clearance to other existing overhead lines and obstructions such as buildings, etc., will be in accordance with Electricity Supply Industry (ESI) Standard 43-8 Overhead Line Clearances or other appropriate standard.

Wood Pole Supports

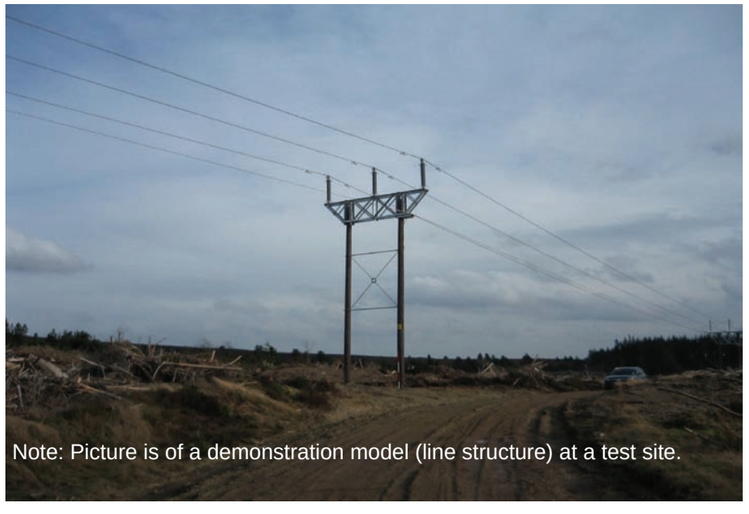
Four types of wood pole support structures are used to carry the overhead line part of the connection:

- **Intermediate or Line Structures** which comprise the majority of the overhead line route;
- **Section or Angle Structures** which are used when the overhead line route requires a change of direction;
- **Terminal Structures** which are required for the transition between the overhead line sections and the underground cables; and
- **Failure Containment Structures** which are a requirement of European / British Standard document BS EN 50341 in case of conductor failure.

All wood poles are fully seasoned and are treated with an appropriate preservative. On the section, angle, terminal and failure containment structures cable stays are used to provide greater rigidity.

Figure 3.2 below illustrates an intermediate wood pole structure which will form the majority of the overhead section of the route.

Figure 3.2 Wood Pole Model Line Structure



Note: Picture is of a demonstration model (line structure) at a test site.

Legend

- Proposed Overhead Line Route
- Andershaw Substation
- Andershaw Boundary
- Coalburn Substation

SP TRANSMISSION

Project	Andershaw - Coalburn Proposed 132kV Overhead Line			
Title	Figure 3.1: Proposed Overhead Line Route			
Scale	1: 50,000	Drawn by	DR	Rev.
Date	Nov '08	Checked by	IAB	-

FABER MAUNSELL | AECOM

Span Lengths

The span length i.e. the distance between two adjacent structures, varies according to a number of factors including topography, prevailing ground conditions and elevation. Typically the span lengths range between 50m and 120m, with an average of 60 - 80m.

Overhead Line Conductor Arrangement

Galvanised steelworks will be located at the top of the wood pole structure. The insulator and conductor arrangement is attached to the steelworks at the top of the wood pole structures. The phase insulators are constructed of porcelain, glass or modern composite materials.

On the intermediate wood poles structures, conductors are vertical. On angle or terminal wood pole structures the conductors are horizontal with insulators located on the top of the steelwork.

Below the cross arm a fourth conductor acts as an earth conductor. It provides a path for fault current and is also a means of transmitting information via a fibre optic core.

On every wood pole structure, the overhead line is earthed using a copper conductor and copper rods below the ground. The amount of earth conductor required at any given wood pole structure is dependent on the resistance of the surrounding bedrock or soil.

Underground Cables

Due to technical reasons, at the northern end of the grid connection in order to link the overhead line with Coalburn substation underground cables will be used. The conductors and optical ground wire will be located in an excavated trench 1.25m deep and 0.51m wide. Within the trench the conductors and ground wire will be contained in individual ducts.

3.4 Construction Phase

Pre-Construction Activities

Prior to construction a number of activities will be undertaken including:

- Precision ground surveys along the centre line of the route and 10m either side in order to determine the ground profile and identify exact wood pole locations.
- Removal or lopping of trees on or in close proximity to the route of the overhead line to obtain the necessary safety clearance to conductors.
- Establishment of temporary storage areas for plant and equipment. These will be situated at convenient locations in agreement with the Contractor and landowners.
- Agreement regarding access routes and arrangements with land owners / occupiers.
- Preparation of temporary access routes as required.

Construction Access and Delivery of Materials

Vehicular access to a maximum width of 5m will be required to every wood pole location along the length of the route. Wherever possible access will be taken from existing roads, forestry or agricultural tracks. Where there is no existing access, temporary access tracks, either a track-way system or temporary surfaced access road, will be constructed following the agreement of landowners or occupiers.

Construction will typically involve the use of a selection of vehicles including:

- 4 wheel drive vehicles fitted with lifting devices to deliver wood poles, steelwork, insulators, conductor drums and stringing equipment.
- HGVs may be required to deliver and remove construction plant and materials.
- Vans delivering construction staff.
- A JCB and / or 360 degree excavator for undertaking earthworks, ground levelling and erection of wood poles.
- Forestry vehicles required for felling.
- Tractors and Mobile Elevated Working Platforms (MEWP) to undertake stringing of cables and conductors.

Following construction all temporary access tracks will be reinstated. Plant and equipment will be stored at temporary compounds along the route. During construction conductor drums will be delivered as close as possible to the pole sites from which they are to be pulled.

General access to the construction areas will be taken from the A70 or B7078. Prior to construction and immediately after are when vehicle movements will be most concentrated. This will be due to the delivery and removal of plant and materials. Deliveries would be controlled and staggered so that they do not result in significant effects. Daily movement of staff is not considered to give rise to significant effects. It would involve fewer vehicle movements and these would occur mainly at the start and end of the working day.

During the construction period temporary traffic management measures may be required during conductor stringing particularly where the route crosses over the A70, Shoulderigg Road and Coalburn Road.

Wood Pole Erection

Localised earthworks and potentially ground levelling will be undertaken in order to erect the wood poles. An area of 600m^2 will be required at each pole location while construction takes place. Excavations, typically to a depth of 2.5m, will be required to allow the wood pole brace blocks and / or steel foundation braces to be installed. Earth conductors will then be laid horizontally at the base of the wood poles at a depth of 0.6m. Earth rods will then be inserted vertically along the route of these conductors. The excavations will be backfilled with the excavated material and any adjacent affected land reinstated.

Conductor Stringing

Overhead line conductors are generally constructed in short sections up to as much as 2km in length. When all the poles within section have been erected, insulators are installed on the tops of the wood poles along with running blocks. The conductors are then fitted using Continuous Tension Stringing.

A pulling winch is located at one end of the line section with a conductor drum and tensioner with a hydraulic brake at the other. The conductor is attached to a heavy duty pilot wire and pulled through sections one conductor at a time under constant tension. This method means that conductors are above ground at all times.

A working area of approximately 1000m^2 will be required to accommodate the winches used to string up the conductors. These areas will be required roughly every 2km at each short section where the conductors are being strung. The location of the working areas will be dependent on the availability of local access and the terrain.

Underground Cabling

Where the route is undergrounded a 15m wide working corridor will be established. Within this, a trench will be opened with a 360 degree excavator. Ducts will be laid within the trench and following this the conductors drawn through. The trench will then be backfilled and consolidated with the excavated material. Topsoil and vegetation will be retained and used as part of the reinstatement.

Construction Timescales

The construction of the overhead line will be timed to coincide with the construction of Andershaw windfarm. Construction of the proposed overhead line connection is expected to take 60 weeks, based on a typical rate of progress of 1km per 3 to 4 weeks.

Construction Noise

Noise impacts associated with the delivery and installation of the wooden support poles and electricity cabling, including all ancillary operations such as site preparation and delivery, are likely to be short-term and transient in nature. To ensure construction noise is minimised, a number of measures will be implemented as outlined in British Standard (BS) 5228. These include:

- Exhaust silencing and plant muffling equipment to be maintained in good working order;
- All working to be undertaken during the normal working day; and
- Loading/unloading sites to be located away from residential or other sensitive properties and shielded from those properties where practicable.

3.5 Operation Phase

General Operation and Maintenance

The majority of components which make up the overhead line require little maintenance; however, regular inspection of exposed elements which suffer from corrosion, wear, deterioration and fatigue will be required to ensure the safety of all components is in accordance with the Electricity Safety Quality and Continuity Regulations 2002.

Overhead transmission lines require refurbishment after approximately 40 years. Likewise, wood poles have an expected lifespan of around 40 years.

Operational Noise

Overhead line noise is generated when the conductor surface electric stress exceeds the inception level for corona discharge activity. Transmission and distribution line conductors are designed to operate below this threshold. Surface contamination on conductors will, however, cause a local enhancement of electric stress and possibly initiate discharge activity. At each discharge site a limited electrical breakdown of the air occurs. A portion of the energy associated with the corona process is released as acoustic energy and radiates into the air as sound pressure waves.

The highest noise levels generated by a line generally occur during rain. Water droplets collect on the surface of the conductor and may initiate corona discharge. The number of droplets, and hence the noise level will depend primarily on the rate of rainfall.

Audible noise levels are predicted to be imperceptible due to the distance between the overhead line and the nearest properties. As a result the overhead line is not predicted to result in significant noise levels.

Electric and Magnetic Fields (EMF)

Extremely low frequency (ELF) electric and magnetic fields (EMFs) are found virtually everywhere in our environment where electricity is used or transported. Common sources include distribution and transmission lines, appliances, and wiring to and in buildings.

Electric fields are the result of voltages applied to electric conductors and equipment. Most objects including fences, shrubbery and buildings easily block electric fields. Therefore, certain appliances within the homes and the workplace are the major sources of electric fields indoors, while power lines and electric trains are the major sources of electric fields outdoors.

Magnetic fields are produced by the flow of electric currents, however, unlike electric fields, most materials do not readily block magnetic fields. The magnetic field level at any point depends on characteristics of the source and its distance from the point of measurement.

The levels of both electric fields and magnetic fields diminish with increasing distance from the source. The background levels of electric fields and magnetic fields in residences are between 1-20 volts per metre(V/m) and 0.01-0.2 microtesla (μT), respectively.

The proposed overhead line is a source of both electric and magnetic fields, whilst the proposed underground cable is a source of magnetic fields only. Fields vary greatly from line to line and over time, and a line typically produces fields much less than the maximum it is capable of. Table 3.1 shows typical ground-level electric field and magnetic field levels from 132kV overhead lines.

Table 3.1 Typical Ground-level EMF Levels from Overhead Lines

Voltage		Magnetic Field (microteslas)	Electric Field (volts per metre)
132kV	Typical field *(under line)*	0.5 – 2	1,000 – 2,000
	Typical field *(25m to side)*	0.05 – 0.2	100 – 200
	Typical field *(100m to side)*	0.01 – 0.04	2 – 20

There are no statutory regulations in the UK which limit the exposure of people to power-frequency electric or magnetic fields. However, the Heath Protection Agency (HPA) has recommended to the Government that the UK follow the exposure guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). For electric fields, the guideline level for human exposure 5000 volts per metre and for magnetic fields it is 100 microteslas.

Power-frequency field strengths near ground level in the vicinity of high voltage power lines and substations should not exceed the guidelines recommended by the ICNIRP.

Effects of Electric and Magnetic Fields

Table 3.2 below outlines the sources of possible impacts and associated effects of the proposed overhead line and underground cable. All possible field effects can be addressed by compliance with best practice and industry standards as described below.

Table 3.2 Possible effects of EMFs

Source	Possible Effect
Electric Field	Field perception Radio interference Audible noise
Magnetic Field	Induction on fence wires, pipelines or other conductive objects that parallel overhead lines for long distances Possible association with childhood leukaemia for long-term average exposures above 0.4μT

Over the past 20 years it has been suggested that exposure to power-frequency magnetic fields of this magnitude could be linked with various health problems, ranging from headaches to Alzheimer's disease. The most persistent of these suggestions relates to childhood cancers.

A number of epidemiological studies have suggested an association between the incidence of childhood cancers and the proximity of homes to power transmission and distribution lines or power-frequency magnetic-field strengths in the home. Other studies, notably the world's largest ever study of its type, the UK Childhood Cancer Study (UKCCS) conducted during the 1990s and published in 1999, have failed to confirm such associations. The Childhood Cancer Research Group (CCRG) produced a study (also known as the "Draper" study) in 2005 which found an association between childhood leukaemia and 274kV/400kV power lines. This association extended too far from the lines to be caused by magnetic fields or other factors and so there is no satisfactory explanation for the findings.

No causal link has been established between cancer (or any other disease) and magnetic of electric fields and indeed there is no established mechanism by which these fields could cause or promote the disease. Scientists recognise the possibility of a risk associated with high exposure to magnetic fields but it is no more than a possibility.

Any suggestion of a possible health risk is taken seriously by the electricity industry and the industry is continuing to support high quality research to help to gain a clearer picture of EMFs.

Given the account taken of residential properties in the routeing process, the levels of EMF will have diminished to typical values that are within the range of levels measured in UK residences. The magnetic field, averaged over 24 hours, in the majority of homes in the UK is between 0.01 and 0.2 microteslas.

Mitigation

As a result of the routeing strategy, the proposed overhead line route reflects precautionary and good practice measures to route the line away from residences and other sensitive land uses where possible. A consideration of the reviews by the World Health Organisation (WHO), other health agencies and research support the assessment provided by the Health Protection Agency (HPA) and its advisors that the evidence for an association of magnetic fields with leukaemia is inconclusive and that:

"*the epidemiological association may be due to chance, confounding factors or some unrecognized artefact related to the way the data have been collected. The review of the experimental studies gives no clear support for a causal relationship between ELF EMF and cancer*" (HPA, 2008)

The good practices proposed by SP Transmission (SPT) are appropriate and consistent with the recommendations of the HPA and other health agencies. The electric and magnetic fields from the proposed line will not exceed the guidelines published by the ICNIRP and no mitigation is necessary. SPT will continue to act upon the current advice of the Government and HPA in relation to the possible risks to human health from power-frequency fields from overhead and underground power lines.

The distances to nearby dwellings and to other infrastructure as well as the experience and standard practices of SPT in addressing radio interference and magnetic induction justify the classification of these effects as of very limited significance.

3.6 Decommissioning

Should the overhead line require decommissioning this would involve the use of small scale plant and equipment similar to that involved in construction. The sections of the wood pole structure below ground level would be left in-situ with sections of the wood pole structures above ground including all steelworks and conductors being removed.

4. Approach to Environmental Impact Assessment

4.1 Introduction

This chapter sets out the broad approach that has been followed in undertaking this Environmental Impact Assessment (EIA). It summarises the key stages that have been followed, in line with EIA good practice as described in Planning Circular 8/2007. This chapter also provides a section on the assumptions made during the EIA process.

4.2 The Electricity Works (EIA) (Scotland) Regulations 2000

EIAs have been required for certain major developments since the implementation in the UK of the European Council Directive on Environmental Assessment (EC Directive 85/337/EEC). The Directive was implemented in the UK in 1988 and subsequently amended by Directive 97/11/EC.

Directive 97/11/EC is implemented by the Electricity Works (EIA) (Scotland) Regulations 2000 . These Regulations set out the information that must be included in an ES, such as:

- A description of the development, comprising information about the site and the design and size of the project;
- An outline of the main alternatives considered and an indication of the main reasons for the chosen scheme;
- The data necessary to identify and assess the main effects that the project is likely to have on the environment;
- A description of the likely significant effects of the project on the environment;
- A description of the mitigation measures envisaged to avoid, reduce or remedy significant adverse effects;
- An indication of any difficulties encountered in compiling the required information; and
- A Non-Technical Summary of the above information.

The Electricity Works (EIA) (Scotland) Regulations 2000, implemented by Directive 97/11/EC, apply to applications under Section 37 of the Electricity Act 1989 for consent to install or keep installed an electric line above ground. Under Regulation 2(1), the proposed route, from Andershaw windfarm to Coalburn substation, is a Schedule 2 development as Schedule 2(d):

"*an electric line installed above ground with a voltage of 132 kilovolts or more, the installation of which (or the keeping installed of which) will require a section 37 consent but which is not a Schedule 1 development*".

As described in Chapter 1, Schedule 2 developments do not require a mandatory EIA. In determining the requirement to undertake an EIA, the potential for the scheme to result in significant environmental effects must be considered and if appropriate a Screening Opinion as to the need for EIA can be requested from the Scottish Government.

SPT, mindful of their responsibilities to people and the environment, as well as their statutory duties; consider it appropriate to undertake an EIA for this overhead line development.

4.3 The EIA Process

EIA is the process of compiling, evaluating and presenting all of the significant environmental effects of a proposed development. The aim of the assessment is to help produce an environmentally sympathetic project. Detection of potentially significant adverse environmental impacts can then lead to the identification and incorporation of appropriate mitigation measures into the scheme design.

The main steps in the assessment procedure are as follows:

- Baseline surveys are carried out to provide a description of the environmental character of the area likely to be affected by the development. This information is provided to the scheme designers at the earliest opportunity;
- Relevant natural and man-made processes that may change the character of the area are identified;
- Consideration is then given to the possible interactions between the proposed development and both existing and future site conditions. These interactions or impacts are assessed using stated criteria based on accepted guidance and best practice
- Using the initial designs of the development, the possible environmental effects, both direct and indirect, are predicted;
- Recommendations can then be made to avoid, minimise or mitigate adverse effects and enhance positive effects. Alterations to the design can then be reassessed and the effectiveness of mitigation proposals determined;
- Any uncertainties inherent in the methods used, impact predictions made and conclusions drawn would be identified during the course of the assessment process;
- The results of the EIA are set out in the ES.

4.4 Approach to the Assessment of Impacts

Determining the significance of impacts arising from the proposed scheme is a key stage in the EIA process. It is this judgement that is crucial to informing the decision-making process. However, defining what is significant is not a simple task. In order to assess the overall significance of an impact it is necessary to first establish the magnitude of the impact occurring in the context of the sensitivity or importance of the receiving environment.

Magnitude of Impact

The magnitude of potential impacts (both positive and negative) on environmental baseline conditions is identified through detailed consideration of the proposed development taking into account the following:

- Relevant legislative or policy standards or guidelines;
- The degree to which the environment is affected, e.g. whether the quality is enhanced or impaired;
- The scale or degree of change from the existing situation as a result of the impacts;
- The duration of the impact, e.g. whether it is temporary or permanent; and
- The reversibility of the impact.

The criteria used to assess impact magnitude are provided in the relevant chapter of the ES.

Sensitivity or Importance of Receptor

The sensitivity of the baseline conditions is assessed according to the relative importance of existing environmental features on or near to the site (e.g. whether it is of national, regional or local importance), or by the sensitivity of receptors which would potentially be affected by the development.

Criteria for the determination of sensitivity (as 'high', 'medium', or 'low') or of importance (e.g. 'international', 'national', 'regional' or 'authority area') are established based on approved guidance, legislation, statutory designation and/or professional judgment. The criteria for each environmental parameter are provided in the relevant chapter of the ES.

Significance of Impact

The significance of the impacts arising from the proposed development are categorised throughout the ES using a seven-point scale, as follows:

- None (i.e. little or no effect);
- Minor (adverse or beneficial);
- Moderate (adverse or beneficial); and
- Major (adverse or beneficial).

The general approach adopted in the assessment of significance is outlined in the matrix shown in Table 4.1, right. A combination of the magnitude of the impact under consideration and the sensitivity of the receiving environment determines the impact significance.

Note that when the significance of impacts is assessed this takes into account mitigation, i.e. the assessment applies to the residual impacts of the scheme, which can be defined as any impact that would remain following the implementation of proposed mitigation measures. Assumptions relating to mitigation and detailed design are set out in Section 4.5 below.

For some topics, alternative categories have been added where a greater level of definition is required.

In general terms if an impact is negligible it is environmentally acceptable; minor significance reflects the fact that the impact is manageable. Impacts assessed as moderate or higher are considered to be 'significant'. It should be noted that throughout the ES, the terms impact and effect are used interchangeably, in line with Planning Advice Note 58.

Table 4.1 Assessment of Impact Significance

Magnitude	**Sensitivity**			
	High: The receptor has little ability to absorb change without fundamentally altering its present character, is of high environmental value, or of international or national importance.	**Medium:** The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of national importance.	**Low:** The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.	**Negligible:** The receptor is resistant to change and is of no environmental value.
High: Total loss or major alternation to key elements /features of the baseline conditions such that post development character/ composition of baseline condition will be fundamentally changed	**Major**	**Moderate**	**Moderate**	**Minor**
Medium: Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed.	**Moderate**	**Moderate**	**Minor**	**None**
Low: Minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character/ composition of the baseline condition will be similar to the pre-development situation.	**Moderate**	**Minor**	**None**	**None**
Negligible: Very little change from baseline conditions. Change is barely distinguishable, approximating to a “no change” situation.	**Minor**	**None**	**None**	**None**

Construction, Permanent & Operational Impacts

Impacts have been separated into three 'types' based on different phases of the development:

- Construction impacts are temporary, short-term impacts that occur during the construction phase only;
- Permanent impacts are those long-term effects that would occur as a result of the development and may include the introduction of new structures or the loss of habitat; and
- Operational impacts , i.e. those impacts resulting from operation and maintenance of the overhead line.

Decommissioning Impacts

Should the overhead line require decommissioning this would involve the use of small scale plant and equipment similar to those involved in construction. The sections of the wood pole structure below ground level would be left in-situ with sections of the wood pole structures above ground including all steelworks and conductors being removed.

Impacts arising from decommissioning are similar to those predicted to occur during construction. They would include temporary disturbance of land and habitats as well as the increased risk of pollution. For the purposes of the assessment impacts resulting from decommissioning have been assessed as the same for construction.

Inter-Relationships Between Impacts

For the purposes of the EIA, the potential impacts of the scheme are considered in terms of impacts on each of the discrete environmental topic areas. However, in reality, topic areas such as 'water quality', 'ecology' or 'landscape' cannot always be considered in isolation since changes affecting one factor may often have secondary implications for other areas. Thus, if one impact of the scheme is to alter the quality and quantity of a watercourse, flora and fauna may be affected as a secondary effect. Under some circumstances, it is possible for the secondary or indirect impacts to actually be more significant than the changes that triggered them. Therefore where potential interactions between environmental topic areas occur these are highlighted in the text.

Cumulative Impacts

Combined and cumulative effects on specific resources or receptors are described, where relevant, in each of the specialist chapters. Cumulative effects may arise, where for example landscape and visual resources, land use or ecological receptors are impacted on by other developments in addition to the proposed overhead line. Cumulative impacts have been considered within the assessment and the baseline against which impacts have been considered has assumed a situation whereby Andershaw windfarm has been constructed. Cumulative effects with existing overhead lines and Hagshaw Hill windfarm have also been considered.

Whilst there are other windfarms at various stages of the planning process within the wider area; including the consented Clyde windfarm, the relatively small scale of the proposed grid connection and the large separation distance between it and the various windfarms (over 13km) are such that no cumulative impacts are predicted to result.

4.5 Uncertainty, Assumptions and Limitations

General

The EIA process is designed to enable good decision-making based on the best possible information about the environmental implications of a proposed development. However, there will always be some uncertainty as to the exact scale and nature of the environmental impacts. This uncertainty arises because of the level of detail and information about the scheme available at the time the assessment was carried out and/or due to the limitations of the prediction process itself.

Key issues relating to assumptions are described below. Other topic specific assumptions are set out, where necessary, in Chapters 5 to 10 of this ES.

Level of Design Detail for EIA

It is acknowledged that the scheme which is eventually designed and constructed may differ slightly from the design details that have been used in the EIA and reported in this ES. As described in Chapter 3 the Section 37 Application includes a micrositing 'tolerance' to allow for minor deviations to wood pole locations according to pre-construction surveys. The EIA has been undertaken based on a design which specifies pole locations, however, as these are subject to minor deviations the assessment considers the area surrounding wood pole locations. A balance has been sought in the EIA between, on the one hand, specifying enough detail to undertake an assessment that meets the requirements of the EIA Regulations, and on the other hand, avoiding specification of the design to a point that restricts the scope for cost effective design.

The environmental impacts that are reported in this ES represent a worst case scenario and the level of mitigation described effectively sets the minimum standard which will be achieved by the final scheme. SPT is committed to ensuring that where details of the scheme differ from those assessed in the EIA, the project will not generate additional significant adverse environmental impacts that have not been assessed in the EIA.

4.6 Mitigation

Approach to Mitigation

A standard hierarchical approach to identifying mitigation requirements has been used to inform the EIA:

- **Avoid**: in the first instance, mitigation should seek to avoid the adverse effect at source for example, by locating development away from a sensitive receptor.
- **Reduce**: if the effect is unavoidable, mitigation should seek to reduce the significance of the impact.
- **Offset**: if the effect can neither be avoided nor reduced, mitigation should seek to offset the impact through the implementation of compensatory mitigation.

The proposed overhead line has been developed through an iterative process, a considerable element of which involved seeking to avoid or reduce significant environmental effects. The package of mitigation measures to be implemented during the construction and operation of the overhead line are set out in Chapter 11 of this ES.

Assumptions Relating to Mitigation

Where the potential for significant impacts has been identified, the scope for their mitigation has been discussed with the design team. In stating the mitigation measures in the ES, SPT is committed to the implementation of all those measures described. SPT is committed to ensuring that the design, construction and operation of the overhead line is within the parameters that were assessed in the EIA. The scheme will not generate significant adverse environmental impacts that have not been assessed.

4.7 Consultation and Scope of EIA

Introduction

As part of both the routeing study and the EIA process, consultation has been undertaken with statutory and non-statutory consultees. The aims of this were:

- To request information in order to understand and identify the environmental baseline;
- To inform consultees and the public about the details of the proposed overhead line and how it was identified; and
- To enable consultees to express their opinion on the overhead line and the methods that would be employed in undertaking the EIA.

Consultation

The Consultation Document described the initial stages of work undertaken in identifying the proposed route. At the outset of the routeing study a wide ranging consultation was undertaken with stakeholders and other interested parties. The primary aims of this were to identify all relevant baseline environmental information and consider the views of consultees on the routeing process.

As part of the routeing study, public consultation was undertaken. This included meeting with local community councils to discuss the project and displaying exhibition boards at prominent public locations in Douglas and Coalburn. This ensured that the local community was aware of the proposed overhead line and that any concerns it held could be addressed.

Scoping

Following production of the Consultation Document, a Scoping Request was prepared and submitted to the Scottish Ministers in accordance with Regulation 7 of the Electricity Works (EIA) (Scotland) Regulations (As amended) 2008.

This provision of the Regulations allowed SPT to seek clarification from the Scottish Ministers as to the information required to inform the ES prior to submitting the Section 37 Application. Scoping is a preliminary task within the EIA process and the Scoping Request provides a focus and mechanism for consulting on and agreeing the content and methodology of the subsequent EIA.

In responding to the request with a formal Scoping Opinion, the Scottish Ministers obtain the views of the Consultation Authorities including SNH, SEPA and the local planning authority. The Scoping Opinion was received

on the 15th January 2008. The issues identified for consideration within the ES included:

- Land Use Planning
- Landscape and Visual Amenity
- Ecology and Nature Conservation
- Archaeology and Cultural Heritage
- Water Environment

Summary of Scoping and Consultation Responses

Statutory agencies and bodies consulted during the EIA process and their responses are summarised below in Table 4.2. Full copies of the responses received can be found in Appendix C.

Table 4.2 Summary of Scoping and Consultation Responses

Consultee	Summary of Response	Summary of Action Taken
Fisheries Research Services (FRS)	• Information on local fish and fisheries should be included in addition to identification on where any potential impacts could occur and offer suitable mitigation.	• Direct impacts on fisheries are considered unlikely; wood pole structures span surface watercourses, however, no work would occur within watercourses. Where works occur in the vicinity of watercourses the potential to impact on water quality is considered (Chapter 11 Ground conditions and the Water Environment) and the secondary effects on fisheries acknowledged. Mitigation to prevent pollution of watercourses is proposed.
Forestry Commission Scotland (FCS)	• Advise that the visual impacts associated with woodland felling and suggested the landscape impact of routeing through woodlands be investigated. • Reference should be made to the potential for instability resulting in windthrow risk. • Detailed habitat and species survey should be undertaken, including Phase 1 to highlight and protect any areas of natural heritage value.	• Proposed overhead line route makes best use existing wayleaves and rides through woodland with only minimal felling, lopping and pruning required. • Increased windthrow risk is considered within the ES and will be assessed, where appropriate, following identification of precise areas to be cleared. • Appropriate ecological surveys, including Phase 1 Habitat Survey were undertaken, details of which can be found in Chapter 8 Ecology and Nature Conservation.
Health and Safety Executive (HSE)	• HSE has no comments.	• No action required.
Historic Scotland	• Provided advice on the scope of the assessment sources of baseline information and the types of impacts that should be considered within the assessment. • Advised that detailed information and advice on the project should be sought from the Council Archaeological Service, West of Scotland Archaeological Service (WoSAS).	• WoSAS have been contacted and their advice has been considered in preparing Chapter 10 Cultural Heritage and Archaeology.
Royal Society for the Protection of Birds (RSPB)	• Collision risk along the overhead line route should be examined with inclusion of details on areas for wire marking with bird flight diverters or aerial marker spheres.	• Ornithological surveys have been undertaken during the breeding and wintering season in order to establish the presence or lack thereof of birds of conservation importance and identify areas where high densities of birds are present. Survey results are reported in Chapter 9 Ornithology.
Scottish Coal	• Advised that planning applications have been made to SLC for the surface mining of coal from Mainshill Wood. The proposed overhead line route avoids this area. • Advised that Poniel mining operations were underway & an outline planning application for residential development on Dalquhandy OCCS office/car park area submitted. The proposed route avoids all these areas. • Provided guidance on the routeing through the restored site at Dalquhandy. • Highlighted that the proposed overhead line cuts through an area of tree planting carried out as part of the Dalquhandy restoration programme. • Advised on safety clearances and potential crossing points with respect to the Mid-Rig Coal Conveyor	• Taken account of constraints identified by Scottish Coal including areas of economically extractable coal deposits and safety clearances along the route of the Mid-Rig Coal Conveyor. • Overhead line is proposed to continue through existing breaks and rides within the tree planting at Dalquhandy with minimal tree removal anticipated.

Consultee	Summary of Response	Summary of Action Taken
Scottish Environment Protection Agency (SEPA)	• Advise that construction impacts may not necessarily be temporary in nature. Construction activities and creation of access roads can impact on water quality and result in impacts which are not temporary. • Identify ecological surveys that should be undertaken. • Highlight that in considering flood risk the ES should have regard to SEPA's Indicative River and Coastal Flood Map. • Require that impacts on aquatic ecological features be addressed. • Advise that the exact locations of pole structures, storage areas and access routes should be identified within the ES. • Identify that Coalburn Moss is groundwater dependent. • Require that the ES addresses any significant impacts on the physical and ecological status of the water environment. • Require mitigation to be provided to prevent both particulate and chemical contamination of watercourses and manage surface runoff including during periods of high rainfall. • Advise that the requirements of the Controlled Activities Regulations relevant General Binding Rules, SEPA Pollution Prevention Guidelines and the CIRIA SUDS Manual inform drainage mitigation. • Request that method statements are produced for all aspects of the work that might impact on the water environment and require the opportunity to review these prior to the commencement of construction. • Advise that measures should be taken to ensure that waste generation is minimised and in particular waste peat arising from excavations. • Advise on the various legal acts relevant to the works.	• Where construction impacts have the potential to have lasting impact this has been identified within the ES. • The appropriate ecological surveys have been undertaken as part of the assessment. Details of the surveys undertaken are included in Chapter 8 Ecology and Nature Conservation. • SEPA's Flood Risk Map has been reviewed to establish the areas along the route and adjacent to it that are at risk of flooding. • The linkages between water quality and aquatic ecology and the potential to impact on aquatic ecological features has been assessed. • A line design has been prepared, however, pole locations may be microsited subject to the results of precision ground surveys and pre-construction surveys. Storage areas and access routes would be identified in advance of construction. • The importance of groundwater in relation to ecological designations has been identified within the ES. • General Binding Rules, SEPA PPG's and guidance from CIRIA has been reviewed and used to inform mitigation proposals. • Mitigation measures have been summarised within Chapter 13 Schedule of Mitigation. This schedule will inform the preparation of detailed Construction Method Statements and forms the basis of an Environmental Management Plan for the project. • Waste generation is considered within the assessment and mitigation is proposed to ensure that the volume of waste generated is minimised.
Scottish Government	• Impacts on recreation, access and tourism should be assessed within the ES. • Potential effects of Electric and Magnetic Fields (EMF) should be addressed. • Traffic management should be addressed and information provided on route options and methods for delivering plant and materials to site. • Advised on Land Use Planning and National policy guidance to be considered within the assessment. • Advised that the it is considered best practice to set out within the EIA the qualifications of those involved in undertaking the assessment. • Requested that peatslide risk assessment be undertaken.	• Recreation and access have been addressed within Chapter 6 Land Use, Access and Recreation. Significant impacts on tourism are not considered likely and as such it was not considered within this assessment. • EMF was scoped out during the initial stages of the EIA as EMF is not considered to be a significant issue with 132kV overhead transmission lines. This is discussed in detail within Chapter 3 Scheme Description. • Details of the proposed delivery routes and trunk roads to be used are contained within Chapter 3 Scheme Description. • Chapter 5 sets out the Planning Policy Context to the project at local, regional and national levels. • Details of the project team are contained within Chapter 1 Introduction. • Peatslide risk was scoped out as it was not considered a significant issue for overhead lines.
Scottish Natural Heritage (SNH)	• Key issues identified for consideration included ecological impacts, landscape and visual impacts and also impacts on public access. • *Designated Site*s: Advise that the route is in close proximity to Millers Wood SSSI and Coalburn Moss SAC. Potential impacts on either site should be identified and appropriate mitigation proposed. • *Ornithology*: Require survey methodologies and results to be clearly presented. Request information on mitigation and what is proposed to minimise collision risk. • *Protected Species*: Confirm that the mammal surveys identified cover the main protected species likely to be present along the route of the overhead line . • *Habitats and Soils*: identify the presence of peatland habitats in areas adjacent to along the route of the overhead line. Suggest the route avoids new broadleaf planting near Millers Wood to reduce future lopping and felling. Advise that consideration should be given to construction methods and require a Construction Methods Statement be prepared. • *Landscape and Visual*: Require that the ES should include justification for the use of an overhead line as opposed to underground cables for sections of the route. Advise that guidelines for reducing impacts on landscape character types are contained within the Glasgow and Clyde Valley LCA. Expect the ZTV to cover an area of 5km. Confirm that viewpoints should be agreed with SNH and the local authority. Advise that the ES should assess the extent to which visual impacts impact on the integrity of the AGLV and the RSA. Require production of photomontages and wirelines from key viewpoints which illustrate the principle components of the proposal. • *Recreation and Access*: Identify a number of Rights of Way within the area and advise that an assessment of potential effect on them should be made. Mitigation should be proposed where necessary.	• All designated sites are identified within Chapter 8 Ecology and Nature Conservation. Generally these have been avoided in the developing the propose route, however, where the potential exists for impacts on Colburn Moss SAC and Millers Wood SSSI these have been addressed. • Full details of all ornithological surveys undertaken and results can be found within Chapter 9 Ornithology. Where appropriate mitigation measures have been identified. • Protected species surveys have been carried out and the results reported in Chapter 8 Ecology and Nature Conservation. • Areas of peatland have been identified within the Phase 1 Habitat Survey results. Where possible the route has sought to avoid these. Mitigation includes ecological input to micrositing of wood pole structures within particular habitats. • A Mitigation Schedule has been prepared and is contained within Chapter 13. The measures contained will inform the preparation of Construction Method Statements and from the basis of the Environmental Management Plan. • Landscape and visual impacts, including impacts on the integrity of the AGLV and RSA are assessed within Chapter 7 Landscape and Visual Amenity. SPT's policy on undergrounding cables is described in Chapter 2., undergrounding was not considered to be required for the proposed grid connection. A full description of the routeing study and reasons for selection of the proposed route are contained within the Consultation Document (June 2008). The findings of the routeing study are summarised with Chapter 2 Development of the Scheme and Alternatives. A ZTV which extends more than 5km beyond the route has been prepared. A number of photomontages and renders have been produced. These illustrate the scheme from a number of viewpoints and have informed the assessment. • Rights of Way were identified in consultation with the Scottish Rights of Way Society. Potential effects on access are considered with Chapter 6 Land Use, Recreation and Access.

Consultee	Summary of Response	Summary of Action Taken
Scottish Rights of Way Society	• Advised on the presence of Rights of Way within the area and provided maps of recorded paths.	• Impacts on Rights of Way and access are considered within Chapter 6 Land Use, Access & Recreation.
Scottish Wildlife Trust (SWT)	• Expressed concerns over potential effects of undergrounding cable in close proximity to Coalburn Moss. • Recommended that a search of locally designated sites is undertaken.	• Effects on Coalburn Moss have been addressed and are discussed within Chapters 8 and 11., Ecology and Nature Conservation and Ground Conditions and the Water Environment respectively. • During the EIA details of locally designated sites were requested.
South Lanarkshire Council	• SLC provided only a brief response to the scoping opinion due to their current workload. • Recommended that cumulative visual impact of the overhead line and proposed and consented windfarms is made. • Advise that the cumulative visual assessment should consider Andershaw windfarm.	• Cumulative visual impact is addressed with Chapter 7 Landscape and Visual Amenity
South Lanarkshire Biodiversity Partnership	• Advised on the presence of blanket and lowland bog within the area and recommended that there should be a presumption against felling of ancient and/or semi natural woodland.	• Blanket and lowland bog have been avoided where possible. Chapter 8 Ecology & Nature Conservation set out how impacts on such areas will be minimised. • No ancient or semi natural woodland requires to be felled.
West of Scotland Archaeological Service (WoSAS)	• Provided a range of baseline information and records. • Advised on impacts that should be considered within ES including sub-surface archaeological features. • Recommended that micrositing be employed to avoid impacting on unscheduled archaeological impacts.	• Impacts on archaeology including the potential to affect sub-surface features are addressed within Chapter 10 Cultural Heritage & Archaeology. • Micrositing will be used to mitigate impacts where appropriate.

5. Planning Policy Context

5.1 Introduction

This chapter summarises the national planning policy guidance and development plan policies (including adopted and emerging development plan policies) that are relevant to the proposed overhead line.

Note that the function of this chapter is merely to identify relevant policies; there is no requirement under either the Environmental Impact Assessment (Scotland) Regulations 1999 or the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 to review the proposed scheme against such policies. It is, however, helpful within a wider context to establish national, regional and local planning guidance and policy relevant to the proposed overhead line connection.

5.2 The Electricity Act 1989

This Environmental Statement (ES) accompanies the application to the Scottish Ministers, under Section 37 of the Electricity Act 1989 to install and keep installed a 132kV overhead line between Andershaw windfarm and Coalburn substation. The Section 37 Application also includes a request for a direction under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 that deemed planning permission be granted for the overhead line and ancillary development.

When considering development proposals for overhead line schemes a range of planning policy and guidance should be taken into account including:

- Government Energy Policy at both UK and Scottish levels;
- National Planning Policies and Guidance;
- Regional Planning Policies; and
- Local Planning Policies.

5.3 Government Energy Policy

Within the UK, the Government's current energy policy is set out in the Energy White Paper of May 2007. It describes key long term policy goals including reducing emissions of carbon dioxide and increasing the amount of energy provided from renewable sources. The Paper also describes the role the planning system has to play in the delivery of the necessary energy infrastructure.

Targets for the reduction of carbon dioxide emissions are set within the UK Climate Change Bill which seeks a 60% reduction in emissions by 2050. In Scotland, however, the Scottish Government have set more ambitious targets seeking a an 80% reduction by 2050. This target has been set based on the potential for a range of renewable energy developments in the country utilising wind and marine energy resources.

5.4 National Level Planning Policies

National Planning Framework

The National Planning Framework for Scotland (NPF) published in 2004 sets out a vision to guide development in Scotland up to 2025. While it is not prescriptive, the NPF will form a material consideration when determining the outcome of planning applications and appeals.

With specific reference to energy and tackling the problem of climate change the NPF recognises that the Scottish Government has set a target of sourcing 40% of the electricity generated in Scotland from renewable energy sources by 2020. In order to achieve the target and also realise the economic potential of renewable energy sources the NPF acknowledges:

- The capacity of the electricity grid will require to be upgraded;
- Modifications of existing lines may be necessary; and
- New connections to the electricity grid will be required.

NPF 2 will shortly supersede NPF. This also places a strong emphasis on renewable energy and recognises the need to strengthen electricity transmission links.

National Planning Policy Guidance and Scottish Planning Policies

At a national level, planning guidance and advice is contained within Scottish Planning Policies (SPPs) or National Planning Policy Guidance (NPPGs) and is supported by Planning Advice Notes (PANs). SPPs identify key priorities for the planning system and provide statements of Scottish Government policy on nationally important land use and other planning matters. SPPs update and replace NPPGs; however, existing NPPGs will continue to be relevant to planning decision making, until such time as they are replaced by a SPP. Hence the term SPP should be interpreted as including current NPPGs. Relevant SPPs/NPPGs are summarised in below in Table 5.1.

Table 5.1 National Planning Policy

Policy Document	Summary
SPP The Planning System	Provides an overarching view of the Scottish planning system including the purpose and principles of the planning system. It seeks to place planning in the wider context of Scottish Government aims and policies and clarify the expectations of the system and the service.
SPP 6 Renewable Energy	SPP 6 describes how the planning system should manage the development, approval and implementation of renewable energy projects. Central principles include support for a diverse range of renewable energy technologies.
SPP 7 Planning & Flooding	The central purpose of SPP 7 is to prevent development that would have a significant probability of being affected by flooding or which would increase the probability of flooding elsewhere.
NPPG 14 Natural Heritage	The policy states "Scotland's natural heritage includes its plants and animals, its landforms and geology, and its natural beauty and amenity". The NPPG sets out statutory obligations, objectives and recommended approaches for the conservation and management of natural heritage. The planning policy aims to ensure that where development occurs natural heritage features are safeguarded.
SPP 15 Planning for Rural Development	SPP 15 provides guidance and advice with regard to development in rural areas. It sets out the approach, key messages and objectives that should underpin planning policies and decisions affecting rural areas. The objectives and main principles also apply to protected landscapes, including National Parks, but in ways appropriate and sympathetic to their special context.
SPP 23 **Planning and the Historic Environment**	Describes national planning policy for the historic environment and indicates how the planning system will contribute towards the delivery of Scottish Ministers' policies as set out in the current Scottish Historic Environment Policy.

Further planning advice is contained within Planning Advice Notes (PANs). These provide advice on good practice in relation to various topics. The following PANS have been considered in undertaking the EIA of the grid connection:

- PAN42: Archaeology—Planning Process and Scheduled Monument Procedures;
- PAN51: Planning, Environmental Protection and Regulation;
- PAN56:Planning and Noise;
- PAN58: Environmental Impact Assessment;

- PAN60: Planning for Natural Heritage;
- PAN68: Design Statements;
- PAN69: Planning and Building Standards Advice on Flooding;
- PAN75: Planning for Transport; and
- PAN79: Water and Drainage.

5.5 Strategic Planning Policy

The Glasgow and Clyde Valley Joint Structure Plan (GCVJSP) (adopted 2003) forms the foundation for the long term planning and development strategy in the region as well as containing policies that promote the protection of the natural and built environment. Since its adoption in 2003 the plan has undergone a number of alterations to reflect changes in national policy and economic growth. This document refers to the consolidated 2006 Structure Plan which consists of the original policies and strategies and the subsequent alterations. Key strategic policies from this draft are summarised below in Table 5.2.

Table 5.2 Regional Planning Policy

Policy Document	Summary
Strategic Policy 7: Strategic Environmental Resources	Requires that particular regard be had to safeguarding and managing International, National and Strategic Environmental Resources listed in Schedule 7 of the Structure Plan. Schedule 7 includes: • Ecological Resources; • Landscapes; • Existing and Potential Recreational Resources; • Built Heritage; • Agricultural Land; • Mineral Reserves; and • Undeveloped Functional Flood Plain Areas. This policy also advises that there shall be a presumption against any proposals which could have a significant adverse effect upon environmental resources and requires the protection and enhancement of the environmental resources listed in Schedule 7, in accordance with the guidance set out in the NPPG 14 Natural Heritage.
Strategic Policy 8: Sustainable Development of Environmental Resources	Supports developments which satisfies a range of criteria including: • Having regard to the relative sensitivities for further afforestation indicated; • Are located within the Potential Areas of search for significant windfarm developments; • Extend the supply of minerals at existing operational sites or in the locations identified in local plans in the search; and • Safeguard and enhance the Strategic Environmental Resources identified in Schedule 7.
Strategic Policy 9: Assessment of Development Proposals	In order to accord with the Structure Plan, development proposals are required to satisfy a range of criteria including that the location of the development is appropriate in terms of the need to safeguard the environmental resources listed in Schedule 7 or identified in local plans including regard to landscape character and quality.

5.6 Local Planning Policy

At a local level development in South Lanarkshire is controlled by five individual Local Plans, the study area being covered by the Lower Clydesdale Local Plan LCLP (adopted 2004). Following council re-organisations the five Local Plans have been amalgamated to form the South Lanarkshire Local Plan (SLLP) (finalised August 2006). A deposit draft was consulted on in 2006 and a series of modifications presented in March 2007.

It should be noted that the SLLP has not yet been formally adopted. South Lanarkshire Council have published a notification to adopt the plan and subject to approval from the Scottish government it is expected to be adopted in late March 2009.

To a large extent the Local Plan reflects the content of the Structure Plan. It sets out in more detail a planning policy framework to promote and guide development including a range of policies relating to the allocation of land for housing, industry and business, regeneration opportunities and policies promoting the protection of the built and natural environment.

The SLLP sets out five objectives including one specifically aimed at protecting the environment. This objective, '*Promoting Environmental Quality*', states that the SLLP will:

"*Protect and enhance the built and natural environment within the Local Plan area. Focus on design issues, including community safety, to promote sustainable, good quality housing in well planned developments.*"

The objective will be achieved through a number of actions including:

- Protecting the habitats and species identified in the South Lanarkshire Biodiversity Action Plan and designated sites including Natura 2000 protected sites.
- Seeking the protection and enhancement of listed buildings, conservation areas and other built heritage assets; and
- Protecting the landscape quality of South Lanarkshire.

Key relevant policies from the South Lanarkshire Local Plan are summarised below in Table 5.3.

Table 5.3 Local Planning Policy

Policy Document	Summary
Policy STRAT 6: Remoter Rural Areas	All development should seek to enhance the environmental quality of the area, or where enhancement is not possible environmental impacts should be mitigated in line with Policy STRAT 9.
Policy STRAT 9: Environmental Mitigation and Enhancement	Advises that where development is predicted to have a negative environmental impact appropriate site surveys must be carried out to ensure that the impact is prevented, reduced or offset and that where neutral or positive impacts may result these are clearly outlined.
Policy RES 6: Residential Land Use	SLC will resist development detrimental to the amenity of residential areas including development that affects visual amenity and public safety.
Policy ENV4: Protection of the Natural and Built Environment	Advises that all development proposals will be considered in terms of their effect on the character and amenity of the natural and built environment in accordance with NPPG 14 - Natural Heritage. It also provides guidance on development which may affect internationally, nationally and locally designated sites.
Policy ENV6: Local Nature Conservation Sites Proposal	Commits the Council to a review of all recorded Sites of Importance for Nature Conservation (SINCs) to consider the identification of new sites. Until the review is completed, development proposals affecting existing SINCs will be assessed against the requirements of Policy ENV26.
Policy ENV9: Review of Landscape Character	Commits the Council to undertaking an assessment of the landscape character of Council area including a review of related landscape designations within the area.
Policy ENV14: Renewable Energy	Advises that significant windfarm developments are to be directed to the potential areas identified in the Structure Plan. All proposals will be assessed against the criteria set out in ENV 37.

Policy Document	Summary
Policy ENV 19: Natura 2000 Sites	Advises that development likely to have a significant effect on a Natura 2000 site will be subject to an appropriate assessment. Where an assessment is unable to conclude that a development will not adversely affect the integrity of the site, development will only be permitted where there are no alternative solutions; and there are imperative reasons of overriding public interest. Requires the assessment in compliance with this policy to take full account of impacts on the qualifying interests of all Natura 2000 sites including those which adjoin, or are located outwith the boundary of South Lanarkshire.
Policy ENV 20: European Protected Species	Encourages the management and maintenance of areas supporting habitats and species, including those which contribute to the coherence of the Natura network, are Habitats and species listed in Annex I of the EC Habitats Directive; are Habitats and species of community interest listed in Annexes II, IV and V; Habitats of naturally occurring wild birds, particularly those in Annex I of the EC Birds Directive and migratory species. The policy also applies to species listed in Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 as amended. Advises that all these resources will be given full consideration in the assessment of development proposals that may affect them. In respect of animals and plants identified in Annex IV, planning permission will not be granted unless it is demonstrated that the proposal will either not adversely affect any European Protected Species in the area, or that all three tests in Regulation 44 of the Habitats Regulations are likely to be satisfied.
Policy ENV 22: Ancient Monuments and Archaeology	States that where developments would have an adverse affect on scheduled monuments or their setting they will not be permitted. Requires all other archaeological resources to be preserved in situ wherever possible and advises that in some cases an archaeological evaluation may be required prior to the determination of a planning application.
Policy ENV 25: Sites of Special Scientific Interest/ National Nature Reserves	Advises that development that affects a SSSI or NNR would only be permitted where it has been demonstrated that the objectives or overall integrity of the site would not be compromised or the adverse effects are outweighed by social or economic benefits of national importance.
Policy ENV 26: Local Nature Conservation Sites	Development affecting a local nature conservation site will only be permitted where it has been demonstrated that the objectives of the designated site and its overall integrity are not compromised or the significant adverse affects are clearly outweighed by significant social and economic benefits.
Policy ENV 27: Historic Gardens and Designated Landscapes	Development should not adversely affect the character of Historic Gardens or Designed Landscapes. important views to, from and within them, affect the site or setting or component features which contribute to their value.
Policy ENV 28: Regional Scenic Area and Areas of Great Landscape Value	States that within the Regional Scenic Area and Areas of Great Landscape Value, development will only be permitted if it satisfies the requirements of policies STRAT 3 - 6 (as appropriate) and can be accommodated without adversely affecting the overall quality of the designated landscape area. It also advises that within and outwith these areas, in providing for new development, particular care shall be taken to conserve features which contribute to local distinctiveness, including the setting of settlements within the landscape; the pattern of woodland, fields, hedgerows and tree features, special qualities of river corridors, and skyline and hill features, including prominent views.
Policy ENV 33: Development in the Countryside	Requires that development within the countryside complies with policy STRAT 3 - 6. It also advises that it should be demonstrated to the Council's satisfaction that a number of issues are addressed including that the development conserves the natural and built environment and avoids significant adverse impacts on biodiversity; respects existing landscape form; retains or reinstates trees, woodland and boundary features and avoids dominating or adversely interfering with existing views.
Policy ENV 37: Renewable Energy Site Assessment	Advises on the factors to be considered in the assessment of windfarms and other renewable energy developments including demonstrating that the environmental effects of all new transmission lines between the development and the point of connection to the grid have been assessed and been shown to have no significant adverse environmental impact.

5.7 Summary

The application to construct and operate the proposed connection will be made to the Scottish Ministers under Section 37 of the Electricity Act 1989. The Ministers will consider the Section 37 application in the context of a range of policies at national, regional and local level including those relating to protection of the built and natural environment as well as others pertaining to the development of renewable energy schemes.

It should be noted that the need for the connection is related to the application to construct Andershaw windfarm and that the connection will only be constructed should the windfarm application be approved.

6. Land Use, Access & Recreation

6.1 Introduction

This chapter of the ES is concerned with the effects that the scheme will have on land and land use, including access. The scope of the assessment has been developed based on the Scoping Opinion provided by the Scottish Government. Considered within this assessment are the potential impacts on recreational, residential and agricultural areas as well as potential impacts on forestry.

The assessment covers both existing and, where information is available, future land uses. In addition, the assessment also draws on, and provides information to, other elements of the assessment including Chapters 5 and 7, Policy Context and Landscape and Visual Amenity respectively.

6.2 Methods

The following sub-sections detail the methods used to develop the baseline and future land use situation within the vicinity of the overhead line corridor as well as the methods used to assess the potential impacts resulting from construction and operation of the scheme.

Consultation

In order to collate baseline data consultation was undertaken with South Lanarkshire Council, the Scottish Rights of Way Society, the Forestry Commission and Scottish Coal.

Desk Study

The following specific tasks were undertaken in order to inform the baseline data collection:

- Review of 1:10,000 scale base mapping;
- Review of aerial photography;
- Review of the South Lanarkshire Local Plan (SLLP) (finalised August 2006);
- Lower Clydesdale Local Plan LCLP (adopted 2004)
- Glasgow and Clyde Valley Joint Structure Plan (GCVJSP) (adopted 2003); and
- Review of present planning applications and other development proposals in the vicinity of the development.

Field Survey

A field survey of the study area was undertaken on 15th October 2008 focusing on land use within 250m of the proposed overhead line route corridor. Outwith this area no construction activities would occur. The field survey identified key existing land uses, highlighting in particular the more sensitive uses and activities such as existing residential properties close to the route, as well as other important areas including commercial and industrial sites. Table 6.1 below describes the land use categories that were used during the field survey and that form the basis of the land use description.

Table 6.1 Key Existing Land Uses

Land Use Type	Description of Land Use Category
Residential	All types of residential properties and their land boundaries. This includes bungalows, semi-detached, detached, terraced, multi-storey flats and tenements including hotels, B&Bs and their associated facilities and grounds.
Industrial (current)	This category includes current areas of an industrial nature, for example opencast coal mines and associated infrastructure, factories, scrap yards, quarries and waste transfer stations.
Industrial (former)	All areas of former industrial uses including restored opencast coal mines and former shale workings.
Commercial Plantation	All areas of commercial plantation for forestry use including recently planted areas.
Natural Woodland	All areas of long established woodland of a natural or semi natural origin.
Waterbodies	This category includes rivers and burns, including their banks as well as ponds.
Improved Grassland & Agricultural Land	All improved land used for agricultural purposes, both pastoral and arable.
Rough Grazing & Moorland	All areas of unimproved pasture and moorland in its wild state used for grazing.
Recreational land	Facilities used for recreational purposes and local amenity areas, for example golf courses.

It should be noted that there might be some unavoidable discrepancies for particular land use descriptions where, for example, commercial properties may be included in residential areas and some commercial properties may have been classed as industrial (particularly if located in a predominantly residential or industrial area respectively).

Impact Assessment Criteria

The criteria listed in Table 6.2 have been used when determining the significance of the potential temporary and permanent effects of constructing and operating the overhead line.

Table 6.2 Assessment of Impact Significance

Impact	Description of Criteria
Major Adverse Impact	Land take to the extent that it precludes existing or intended use. Activity to the extent that it permanently precludes use.
Moderate Adverse Impact	Land take to the extent that it compromises but does not preclude use. Activity to the extent that it precludes use for an extended period of time. Loss of amenity to an extent that it compromises but does not deter use.
Minor Adverse Impact	Land take peripheral to use. Activity to the extent that it temporarily precludes use. Loss of amenity that does not compromise use.
None	No land take. Existing or intended land use can continue. No discernible loss of amenity.

6.3 Baseline Situation

Existing Land Use

The proposed overhead line route passes through various land use types which are summarised in Table 6.1 above and described within the context of the existing situation below. They are also illustrated on Figure 6.1 (sheets 1 to 4).

It has been assumed that the baseline situation at the time of the assessment will also prevail at the commencement of construction, except where there is information regarding planned changes, which are discussed below.

Wider Context

The area through which the proposed overhead line is routed is centred on the Douglas Valley. It is bisected north east to south west by the Douglas Water and north west to south east by the M74. There are a number of

settlements located in the area including Coalburn, Douglas and Glespin. As well as these there are a number of scattered individual properties located throughout the valley.

Land use within the wider area is predominantly related to the opencast coal mining industry. Three working opencast sites are present, all owned and operated by Scottish Coal. These are Glentaggart to the south served by the Mid-Rig conveyor and Broken Cross in the north. The recently opened Poniel opencast site is located in the centre of the study area close to Douglas. In addition there is also the former opencast coal site at Dalquhandy and a proposed opencast coal site at Mainshill Wood adjacent to the M74.

The other major land uses within the wider area relate to agriculture and commercial forestry. Significant areas of moorland on the upper slopes of the valley are used for rough grazing with some improved agricultural land located on the lower lying areas adjacent to the Douglas Water. Large areas of upland are used for commercial forestry with a mix of mature and immature plantation present.

The following sub-sections discuss land use along distinct sections of the proposed overhead line route.

Andershaw Windfarm to Millers Wood (see Figure 6.1 Sheet 1)

The route of the proposed overhead line begins at Andershaw Windfarm substation and heads through an area of mature commercial plantation primarily consisting of sitka spruce with some recently planted trees on the western periphery of the plantation. As the route runs through the plantation it is routed adjacent to an existing track and the Mid-Rig Conveyor which runs from Glentaggart opencast site to the Mid-Rig disposal point.

On exiting the plantation the overhead line continues upslope of the Mid-Rig Conveyor running parallel to it for approximately 2.5km over moorland before the conveyor terminates at a depot opposite Glentaggart Cottage. During the site surveys the moorland was being used for rough grazing. Along this section the overhead line route spans a number of small watercourses including the Shiel Burn.

The proposed overhead line continues north over improved agricultural land which is used for grazing and passes a residential property at Earl's Mill towards Millers Wood. In the vicinity of Earl's Mill pockets of recently planted plantation forestry are present. Beyond Earl's Mill, approximately 80m south of Millers Wood the overhead line crosses a local road and Glespin Burn and is routed over improved grassland.

Millers Wood to Dalquhandy (see Figure 6.1 Sheet 2)

Land adjacent to Millers Wood comprises mainly improved grassland. The overhead line heads north east over the Douglas Water and the A70 to the opposite side of the Douglas Valley. The lower slopes of the valley comprise improved agricultural land, used for both arable and pastoral farming with the upper sections occupied by moorland used mainly for rough grazing. The proposed overhead line crosses both the improved agricultural land and the moorland in a northerly direction. To the east of the route is Windrow Wood and to the west, Hazelside, a residential property.

At this juncture the route crosses a dismantled railway line which provides access to the adjacent agricultural land and is also a Right of Way. The proposed overhead line runs broadly parallel to the Right of Way / dismantled railway crossing over rough grazing land downslope of Hagshaw Hill windfarm. A number of existing overhead lines also follow a similar direction north towards the Douglas west substation.

The proposed overhead line crosses the access road into Hagshaw Hill windfarm continuing to cross moorland used predominantly for rough grazing. It follows the wayleave of a redundant overhead line which it will replace and enters commercial plantation forestry as it heads towards the former opencast coal site at Dalquhandy. On the periphery of the existing plantation there is an area of recently planted trees through which a wayleave will be required.

Dalquhandy to Muirburn (see Figure 6.1 Sheet 3)

The proposed overhead line is routed through an existing wayleave within a mature sitka spruce plantation on the fringes of the former opencast site. Within the plantation the route crosses a Right of Way.

Outwith the plantation on the northern side the proposed overhead line crosses the site of the restored opencast site at Dalquhandy. As a former industrial area there are currently no discernible land uses. The access tracks within the site are used irregularly; however, adjacent areas of disturbed and subsequently restored land appear derelict. At the time of writing no information relating to potential plans for the redevelopment of the site was available, however, it has been noted that a planning application for housing development located at the former site offices off Middlemuir Road approximately 600m to the north west of the route has been lodged.

On the northern side of the opencast site the route crosses restored land mainly comprising some moorland and tree planting. It crosses over Shoulderrigg Road to the west of Coalburn and is routed over open moorland in a north eastern direction.

Muirburn to Coalburn Substation (see Figure 6.1 Sheet 4)

From Muirburn the overhead line crosses Coalburn Road in a north eastern direction and then heads directly north parallel to the road. It crosses over an area of mixed land use including moorland and a former industrial area which once comprised a shale workings. The overhead line route is located approximately 30-40m east of Coalburn Road and is screened by a band of vegetation including trees and hedges. On the opposite side of the road are a small number of private properties.

The route continues north east passing to the rear of the derelict property at Johnshill. The Forestry Commission have recently purchased the land at and around Johnshill with the intention of planting new forestry as part of the organisations' carbon sequestration programme. The proposed overhead line continues beyond the property over agricultural land turning east until it terminates. An underground cable is used to connect into Coalburn substation.

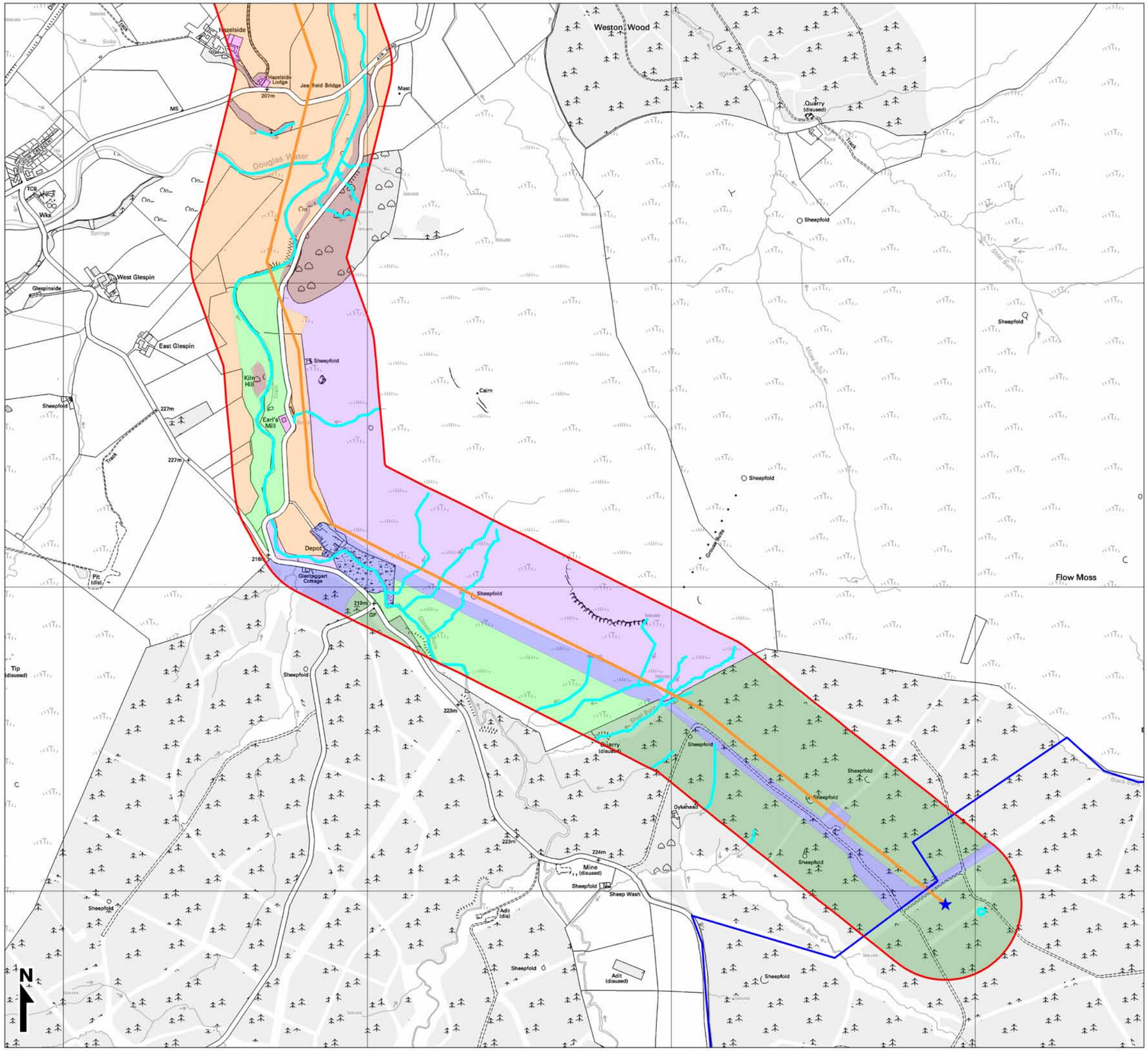
Future Land Use

A summary of significant proposed development in the vicinity of the overhead line route is provided in Table 6.3. It should be noted that none of the planned future developments fall within 250 metres of the proposed overhead line route. These have been identified following a review of planning applications lodged on the South Lanarkshire Council website.

Table 6.3 Future Developments

Location	Development Description	Status
Bellfield Bing and surrounding area, Bellfield Road, Coalburn	Reclamation of site by colliery spoil reworking comprising: (1) Excavation, processing and transportation of material off site (2) Relocation of remnant material within site with subsequent profiling, landscaping and site restoration.	Granted 29-01-2008
Bellfield, Coalburn	Erection of 87 dwellings as well as associated roads and infrastructure work, sustainable drainage, landscaping and enabling works and temporary	Registered
Land at Gunsgreen Middlemuir Road Coalburn ML11 0NN	Residential development	Granted 09-09-2008
Land at Poniel Farm and Adjoining Woodlands South West of Junction 11, M74	Variation to Condition 4 of planning permission ref CL/04/0877 (Extraction of coal and fireclay at Poniel) to permit revised working scheme comprising: relocation of soils and overburden, storage areas; relocation of internal site access road; and relocation of water treatment lagoon.	Granted 30-06-2008
Land at Mainshill adjoining A70 and B7078 near Newmains Farm Douglas South Lanarkshire	Extraction of Coal and fire-clay by opencast methods with restoration to agriculture and woodland.	Registered

During consultation the Forestry Commission advised SPT that they had purchased the derelict property at Johnshill and the surrounding land. In the long term they intend to plant new forestry in this area and sell the Johnshill property for re-development. The overhead line design has been slightly amended to account for this. In order reduce the requirement for multiple wayleaves within future woodland planting it follows an existing 11kV overhead line and passes to the east of Johnshill. Any future forestry planting will take account of the necessary wayleaves required for the grid connection.



Legend

- Proposed Overhead Line Route
- Andershaw Substation
- Andershaw Boundary
- Coalburn Substation
- 250m Buffer
- Rough Grazing & Moorland
- Commercial Plantation (Immature)
- Commercial Plantation (Mature)
- Industrial (Current)
- Natural Woodland
- Improved Grassland
- Industrial (Former)
- Recreational
- Residential
- Rights of Way
- Watercourses

SP TRANSMISSION

Project	Andershaw - Coalburn Proposed 132kV Overhead Line			
Title	Figure 6.1: Land Use (Sheet 1 of 4)			
Scale	1: 12,500	Drawn by	VB	Rev.
Date	Jan '09	Checked by	IAB	-

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Legend

- Proposed Overhead Line Route
- Andershaw Substation
- Andershaw Boundary
- Coalburn Substation
- 250m Buffer
- Rough Grazing & Moorland
- Commercial Plantation (Immature)
- Commercial Plantation (Mature)
- Industrial (Current)
- Natural Woodland
- Improved Grassland
- Industrial (Former)
- Recreational
- Residential
- Rights of Way
- Watercourses

SP TRANSMISSION

Project	Andershaw - Coalburn Proposed 132kV Overhead Line			
Title	Figure 6.1: Land Use (Sheet 2 of 4)			
Scale	1: 12,500	Drawn by	VB	Rev.
Date	Jan '09	Checked by	IAB	-

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Opencast Workings

Opencast Workings

Opencast Workings

Coalburn

Bellfield

Braehead

Middlefield

Netherfield

Newside

Sawmill

Depot

Recreation Ground

Dismantled Railway

Wallace's Cave

Tank

Path

Bracknonside

Sheepfold

Enclosure

N

Legend

- Proposed Overhead Line Route
- Andershaw Substation
- Andershaw Boundary
- Coalburn Substation
- 250m Buffer
- Rough Grazing & Moorland
- Commercial Plantation (Immature)
- Commercial Plantation (Mature)
- Industrial (Current)
- Natural Woodland
- Improved Grassland
- Industrial (Former)
- Recreational
- Residential
- Rights of Way
- Watercourses

SP TRANSMISSION

Project	Andershaw - Coalburn Proposed 132kV Overhead Line			
Title	Figure 6.1: Land Use (Sheet 3 of 4)			
Scale	1: 12,500	Drawn by	VB	Rev.
Date	Jan '09	Checked by	IAB	-

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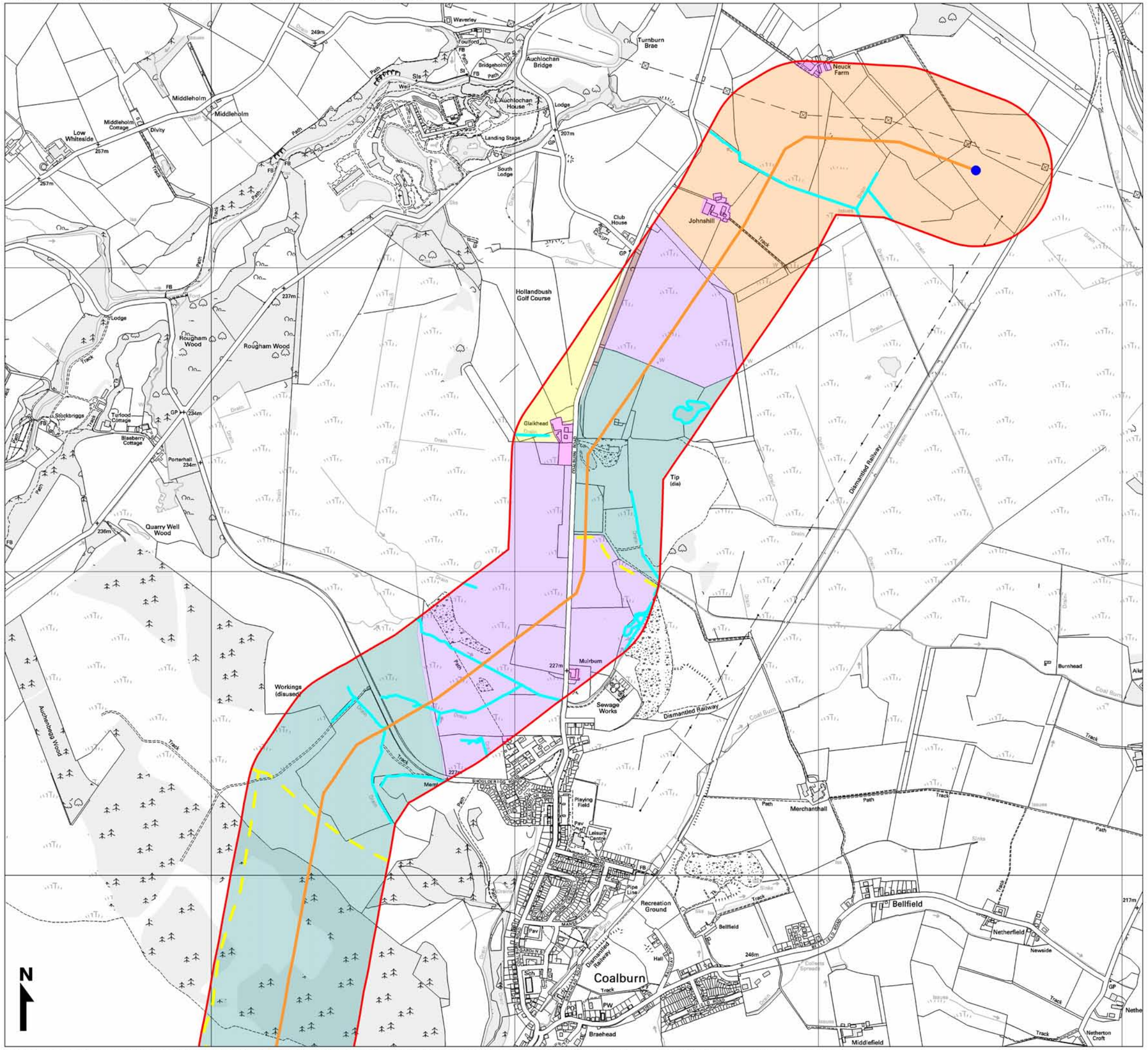

Legend

- Proposed Overhead Line Route
- Andershaw Substation
- Andershaw Boundary
- Coalburn Substation
- 250m Buffer
- Rough Grazing & Moorland
- Commercial Plantation (Immature)
- Commercial Plantation (Mature)
- Industrial (Current)
- Natural Woodland
- Improved Grassland
- Industrial (Former)
- Recreational
- Residential
- Rights of Way
- Watercourses

SP TRANSMISSION

Project	Andershaw - Coalburn Proposed 132kV Overhead Line			
Title	Figure 6.1: Land Use (Sheet 4 of 4)			
Scale	1: 12,500	Drawn by	VB	Rev.
Date	Jan '09	Checked by	IAB	-

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6.4 Predicted Impacts

Construction

During the construction period potential impacts on land use will be primarily related to the temporary landtake resulting from construction activities. During this period particular construction activities may also preclude or reduce land use functions, for example through temporary severance or reduction of access.

Inherent within construction operations is the requirement for construction compounds and work sites along or close to the route. This is necessary for the storage of plant, materials and locating of site offices. There may also be a need to establish temporary access tracks up to 5m wide in order to gain access to working areas.

During construction working areas will be established at all wood pole structure locations in order to allow localised earthworks, ground levelling and erection of wood poles. A larger working area will be required approximately every 2km along the route to accommodate the winches used to string up conductors.

Along a number of sections of the route public paths, Rights of Way and other access tracks will be crossed or will be in the vicinity of construction activities. During construction there could be temporary severance of paths and tracks causing a reduction in access.

During construction of the line, the lopping, pruning and felling of trees will be required in order to provide access and ensure the minimum safety clearances for the overhead line and conductors. Two areas of commercial plantation will be affected by construction with tree removal anticipated to create a wayleave corridor within a section of plantation at Andershaw and to widen an existing wayleave through the plantation south of Dalquhandy. This will require a total area of up to 10ha being removed from commercial forestry (based on a working corridor 70m wide). Some of the woodland to be removed includes immature woodland recently planted. Whilst this is a loss to the area of commercial forestry, this is not considered to be an appreciable change to land use. Indicative areas where trees are to be felled are illustrated in Figures 6.2 and 6.3.

Operation

Permanent and operational effects on land use relate principally to the final total footprint of the proposed overhead line and its overall land take. However, whilst the footprint of the different wood pole structures varies, the relatively small areas of land lost to the placement of the wood pole structures results in a permanent effects negligible.

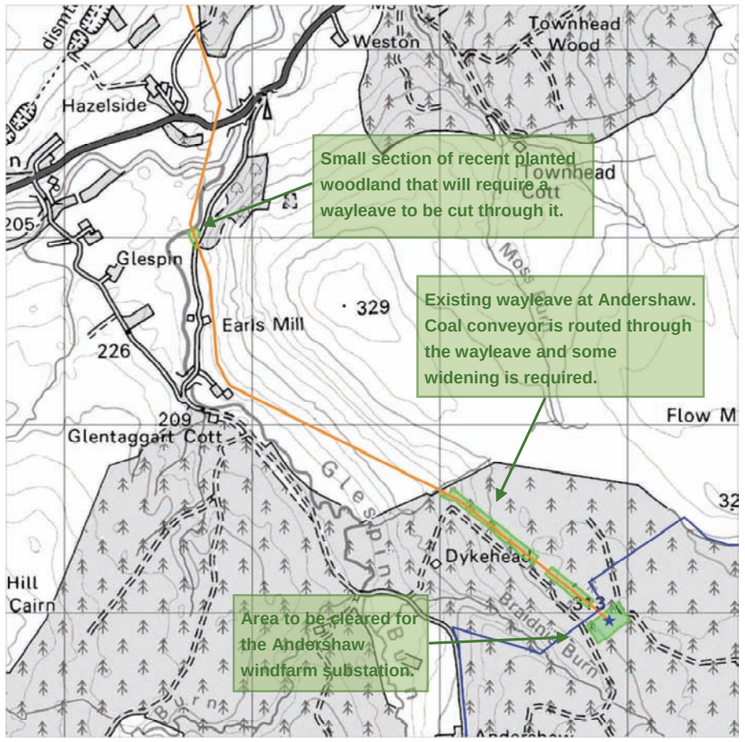
The northern section of the proposed grid connection will be buried underground on approach into Coalburn substation. As a result there will be no change to the long term existing land use patterns.

Where tree felling has occurred during construction the stability of the trees located on either side of the wayleave could be affected by increased windthrow risk. The exposure of previously sheltered trees can increase the risk of windthrow particularly amongst older woodlands and plantations.

Where wayleaves have been reinstated or created they will require some ongoing maintenance to ensure that the minimum safety clearances are achieved; however, the effects of intermittent lopping or pruning are considered to be neutral.

There will be no permanent effects on public paths, access tracks or Rights of Way during operation. These will be restored following completion of construction activities.

Figure 6.2 Indicative Areas for Tree Removal and Lopping Andershaw



6.5 Mitigation

Construction

As far as is practicable, construction compounds, storage areas and workers' facilities will be located in areas which will cause the least disturbance to existing land uses. The locations of such sites will be identified in advance of construction and agreed with the Contractor and affected landowners.

All land temporarily affected by construction activities will be restored upon completion of the works or earlier where appropriate. This will include the removal and restoration of any temporary access tracks or compounds.

Where possible, access to working areas will be provided via existing roads, tracks and paths. Where temporary access arrangements are required they will be located in areas which cause the least disturbance to existing land uses.

Where a new track is required through woodland its location will be agreed with the relevant land owners. It will be located to minimise potential windthrow and in a position where it will be of long-term advantage to the management of the woodland to avoid unnecessary duplication of road construction.

Tree removal including that within commercial plantation will be kept to a minimum. Where trees are to be felled, lopped or pruned such activities will be undertaken by a suitably qualified arborist. Trees felled in areas of commercial forestry plantation will be removed from site for commercial sale wherever possible. Any trees felled and identified as unsuitable for sale will be mulched on site with the material spread evenly over the construction area as part of the reinstatement.

Where construction activities affect existing access tracks, public paths or Rights of Way temporary access arrangements or diversions will be provided for the duration of the works to minimise disruptions to land use function and prevent severance.

Operation

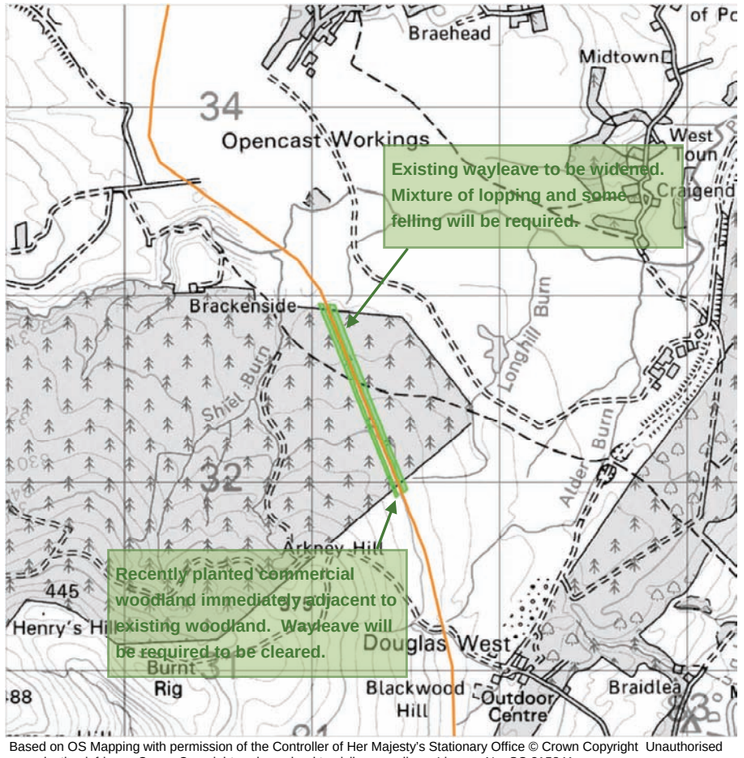
The approach taken to identifying the route of the proposed overhead line considered land use in order to ensure those uses considered most sensitive will be avoided.

The permanent landtake associated with wood pole structures is minimal so no mitigation is proposed.

Prior to construction an assessment will be made of the risk of windthrow from any proposed felling. Where appropriate, management measures will be proposed for any affected sections of plantation. This may include measures such as felling to a windfirm edge with retention of low growing trees and shrubs within the wayleave corridor to reduce the risk of windthrow within plantation areas.

Where wayleaves require to be maintained by lopping or pruning during the lifetime of the proposed overhead line such activities will be undertaken by a suitably qualified arborist.

Figure 6.3 Indicative Areas for Tree Removal and Lopping Dalquhandy



6.6 Residual Impacts

Construction

As the overhead line will be constructed in sections the temporary landtake associated with construction activities will be for short periods of time only. The land required for construction will be minimised as much as possible and affected land reinstated as soon as practicably possible following completion of works. Temporary effects resulting from landtake are considered to be **Minor Adverse**.

Where construction activities could result in the closure of public paths, Rights of Way and other access tracks, temporary diversions will be put in place to ensure the effects of severance are minimised. Effects on access are not considered to be significant.

Operation

In designing the route of the proposed overhead line account has been taken of existing land uses and, where such information was available, future land use. As a result, where possible the route avoids the most sensitive land uses. Whilst some commercial plantation will require to be felled and a small amount of agricultural land lost; the areas lost are minimal and will not affect the continued long term land use. Overall permanent effects on land use are considered to be **Minor Adverse**.

Windthrow risk within the identified wayleaves will be assessed where appropriate and mitigation measures implemented, therefore impacts are assessed as being **Minor Adverse**.

6.7 Summary

Current and potential future land use within the study area has been established through site surveys and a review of maps, aerial photographs, current planning applications and discussions with landowners.

For the purposes of this assessment nine land use categories have been determined including industrial land, commercial forestry and agricultural land. The predominant land uses within 250m of the proposed overhead line are related with agriculture and commercial forestry. Agricultural use tends to be limited to rough grazing particularly on upland and moorland areas whilst on the lower valley slopes improved arable land is present. In the wider area opencast coal mining and associated activities are dominant; three active mines are present (Glentaggart, Broken Cross and Poniel) with a fourth proposed at Mainshill Wood.

The proposed overhead line directly crosses six of the identified land use categories including commercial plantation, land used for rough grazing, improved agricultural land and the former opencast site at Dalquhandy.

A key element in mitigating potentially negative effects on land use has been to avoid routeing over those areas identified as being particularly sensitive or valuable. However, the primary effects on land use relating to the land take associated with the proposed overhead line are unavoidable. In addition, there could also be a potential reduction to land use functions resulting from temporary severance or reduction to access. The landtake, particularly once the overhead line is operational, is minimal. In order to ensure construction impacts are reduced working areas will be minimised and access maintained as far as practicable. Impacts on existing land use have been assessed as **Minor Adverse** and are therefore **Not Significant**.

The land use assessment also considered the effects of tree removal within commercial plantation. The proposed overhead line will require widening of existing wayleaves in mature plantation and creation of wayleaves in recently planted areas. The precise areas to be felled would be determined prior to construction, however, it is estimated that up to 10ha of plantation would require to be felled, or lopped. In the context of the existing plantation coverage in the area this is a negligible amount. Windthrow risk within the identified wayleaves will be assessed where appropriate and mitigation measures implemented, therefore impacts are assessed as being **Minor Adverse** and **Not Significant**.

7. Landscape & Visual Amenity

7.1 Introduction

This chapter of the ES presents the assessment of impacts of the proposed overhead line route on the landscape resource and visual amenity of the study area.

The assessment describes the key components, features and characteristics that make up the various landscape types found within the study area and refers to statutory designations and consultation responses relating to landscape value and sensitivity. It provides an assessment of the potential impacts of the proposed development upon key landscape components and features. It also considers the extent to which loss of features and the introduction of the proposed overhead line and associated infrastructure would influence perception of the landscape types and wider character of the study area. It assesses the effects on the overall pattern of elements that together contribute to landscape character and regional/local distinctiveness.

The visual assessment describes and evaluates the potential change in views of the existing landscape resulting from the proposed grid connection once in operation. The assessment also describes the extent to which the scheme would affect the visual amenity afforded residents, visitors and users of the landscape within the study area.

7.2 Methods

The assessment of landscape and visual impacts are separate but related procedures. This section provides an overview of the methods and techniques used to undertake the baseline landscape and visual assessment and the assessment of impacts upon these resources.

Scope of the Assessment

The assessment considers, in detail, the potential permanent and operational effects on landscape and visual resources resulting from the development.

Construction effects have not been considered in detail as such effects will be temporary and of a short duration. Construction activities would include a number of small scale, transient activities including earthworks, storage of materials and movement of plant and other vehicles. Where it is likely that the residual impacts resulting from the construction phase would be noticeable during the operational phase, these have been assessed. In all other cases the construction impacts are considered to be of short duration and therefore not significant.

The ES reports on the assessment of the proposed route. The selection of this route has resulted from a route options study that mapped and considered a range of environmental constraints relative to a number of potential route options. Landscape and visual interests were the two primary environmental constraints that have influenced the selection of the proposed route and the development of it to the proposed overhead line route.

Route selection has therefore been the principal means by which the permanent and operational effects of the overhead line can be mitigated. Integral elements of the development of the proposed overhead line have been:

- Avoidance of those landscapes, views or vistas considered to be particularly valuable or sensitive to the development of overhead lines;
- Reduction of potential adverse effects such as breaking the skyline through making the best use of local landform and vegetation to provide a backdrop against which visible sections of the proposed overhead line would be viewed; and
- Reduction of potential adverse effects through the line design. The wood pole structures carrying the 132kV overhead line are visually more discreet than the steel lattice towers traditionally used for 132kV overhead lines.

Assessment Guidelines

The landscape and visual assessment has been undertaken in general accordance with the following documents:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA) 2nd Edition, Landscape Institute and Institute of Environmental Management and Assessment, 2002;
- Landscape Character Assessment, Guidance for Scotland and England, Scottish Natural Heritage & The Countryside Agency, 2002;
- Planning Advice Note (PAN) 58; Environmental Impact Assessment, Scottish Executive, 1999; and
- Overhead Transmission Lines Routeing and Environmental Assessment: The Scottish Power Approach, Scottish Power.

The GLVIA acknowledges the relationship between the perception of landscape character and the experience of visual receptors which include residents, visitors, people in their workplace, users of recreational facilities, people travelling through an area and other groups of viewers.

The principles of LVIA involve an appreciation of the existing landscape and its visual form, analysis of its condition and an assessment of its sensitivity to change, a thorough understanding of the development proposals, the magnitude of change that would result from the construction and operation of the proposals and the potential to mitigate impacts. There are three key stages to the assessment:

- Recording and analysis of the character, condition, value and sensitivity to change of the existing landscape and visual receptors (Section 7.3) ;
- An assessment of the magnitude of change likely to result from the development (Section 7.4); and
- An assessment of the significance of impacts based on a combination of sensitivity of receptors and magnitude of change. (Section 7.4)

Specific Assessment Tasks

The following specific tasks have been undertaken:

- A review of the Glasgow and Clyde Valley Landscape Character Assessment dated 1999 (Scottish Natural Heritage Review no 116);
- A review of current and historical Ordnance Survey mapping, aerial photographs and data on conservation interests within the area;
- Analysis of existing and proposed land use data and policies from the South Lanarkshire Local Plan (Finalised 2007) and Lower Clydesdale Local Plan (adopted 2004);
- Identification of the Zone of Theoretical Visibility (ZTV) for the development (the extent to which the proposed development could potentially affect people's views of the landscape within the wider area surrounding the development);
- Site appraisal of local landscape zones and the key landscape, ecological and cultural components determining them. Site recording involving annotation of Ordnance Survey plans supported by a photographic record of the area;
- Field assessment and analysis of affected receptors. Viewpoints representative of receptors and groups of receptors were visited and surveyed using a standardised checklist to enable visual evaluation of sensitivity and magnitude of change leading to assessment of potential impacts;
- Drafting and description of local landscape character zones including analysis of their sensitivity to change;
- Analysis of the change in receptors' views and landscape character and consideration of the potential effect on scenic quality and value related to the impact on specific landscape elements and views. The analysis also considered the potential composite change in identity engendered by the development proposals. The analysis has taken into account any mitigation measures; and
- Evaluation of the effects of the proposed change in views from receptors, local landscape zones and on the broader landscape types and areas defined in the Glasgow and Clyde Valley Landscape Character Assessment.

Consultation

As part of the EIA scoping process the opinions of statutory consultees (Scottish Natural Heritage, Historic Scotland and local authorities) and other bodies were sought on the approach and scope of the landscape and visual assessment for the proposed overhead line. The location of viewpoints to be included in the assessment were confirmed and agreed with SNH who also provided a professional opinion on the sensitivity of

landscape and visual receptors and the likely impacts of the proposed overhead line.

LANDSCAPE RESOURCES

Landscape Character

Landscape character is a composite of physical and cultural elements. Landform, geology, hydrology, vegetation, land cover, land use pattern, cultural and historic features and associations combine to create a common 'sense of place' and identity which can be used to categorise the landscape into definable units (character areas and character zones). The level of detail and size of unit can be varied to reflect the scale of definition required. It can be applied at national, regional and local levels.

Assessment of Landscape Sensitivity to Change

The assessment of sensitivity of landscape character to the type of development proposed has taken account of the following factors:

- Potential effects upon key physical characteristics or features of the landscape or the interests for which the landscape is designated;
- Potential effects upon how the landscape is experienced and aesthetic aspects such as scale, pattern, movement and complexity;
- Potential visibility of the type of development proposed; and
- Scope to modify visual effects by mitigation (e.g. route optimisation) that would be in keeping with landscape character.

GLVIA recommends evaluating quality, value and contribution to landscape character of the key elements or characteristics of the landscape as part of the sensitivity assessment. The assessment of landscape quality or condition should be based on judgements about the "*physical state of the landscape, and about its intactness, from visual, functional and ecological perspectives*" (Landscape Character Assessment, Guidance for Scotland and England).

In this assessment professional judgement has been used to determine the extent to which quality or condition influences sensitivity to overhead line development. In this assessment value is determined by the presence or absence of designated landscapes the effects upon which are assessed separately.

Landscape sensitivity has been evaluated within the study area and is described by a 3-point scale using the criteria listed in Table 7.1 below.

Table 7.1 Landscape Sensitivity Criteria

High Sensitivity	A landscape of particularly distinctive character susceptible to relatively small changes of the type proposed.
Medium Sensitivity	A landscape of moderately valued characteristics reasonably tolerant of change of the type proposed.
Low Sensitivity	A relatively unimportant landscape which is potentially tolerant of substantial change of the type proposed.

Assessment of Magnitude of Change

Magnitude is a measure of the degree of change within the landscape, the nature of the effect and its duration. The magnitude of change caused by the development proposals has been assessed using a 5-point scale using the criteria in Table 7.2.

Table 7.2 Landscape Impact Magnitude Criteria

High Magnitude	Notable change in Landscape characteristics over an extensive area or very intensive change over a more limited area.
Medium Magnitude	Moderate change across a limited area.
Low Magnitude	Small change in landscape components.
Negligible Magnitude	Barely discernible change in any component.
None	No change.

Landscape Significance of Effect Criteria

The significance of effect is judged from a combination of sensitivity and magnitude of impact for each of the receptors affected by the proposed overhead line.

The principal criteria used to evaluate the impact on landscape character are:

- The extent to which existing landscape components and features would be lost or modified by the proposals. For example trees may need to be removed to create a wayleave;
- The frequency of occurrence and extent to which development of the type proposed presently exists within the landscape and the extent to which it influences landscape character; and
- The extent to which the proposed development would become a key feature or characteristic of the landscape.

Impacts can be detrimental where features or key characteristics such as established planting, old buildings or structures have to be removed. Alternatively, it can prove beneficial where derelict buildings or poorly maintained landscape features are repaired, replaced and maintained or there is the introduction of new tree planting and a landscape structure where none currently exists.

Account is taken of the effect that any mitigation measures, typically reinstatement planting, are likely to have in minimising potentially detrimental impacts or improving the landscape composition of the area.

The findings are represented using a descriptive scale ranging from major, moderate, minor and negligible adverse impacts, as shown in Table 7.3 below.

Table 7.3 Assessment of Impact Significance (Landscape)

Type of Impact	Rational for Assessment
Major Impact	The proposal is at considerable variance with the landform, scale and pattern of the landscape such that the character of the landscape is fundamentally altered.
Moderate Impact	The proposal is out of scale with some key features within the landscape, or at odds with the local pattern and landform such that the character of the landscape is considerably altered.
Minor Impact	The proposal does not fit the landform and scale of the landscape and would alter some key features such that the character of the landscape would undergo noticeable change.
Negligible Impact	The proposal would result in barely discernible change to key features within the landscape such that the character of the landscape would undergo imperceptible change.
None	No change.

In terms of ratings for sensitivity, magnitude and significance of impacts, the thresholds represent points on a continuum. Intermediate ratings are used where appropriate to indicate impacts at the higher or lower end of a particular threshold. For example, low to medium would represent an impact towards the higher end of the lower threshold. Medium to low would represent a rating at the lower end of the medium threshold. Impacts are assessed as adverse unless otherwise stated. Effects identified as major or moderate are significant and those as minor or negligible are not significant.

VISUAL RESOURCES

GLVIA recommends analysis of the nature of visual amenity of the study area and the identification of visual receptors that would potentially be affected by the proposed development. Visual amenity is a general measure of the presence or absence of features which, on their own or in combination, detract from the appearance of the existing landscape and features that, on their own or in combination, have a beneficial effect on the landscape.

Visual receptors are the people who experience visual amenity and include residents, visitors, vehicle travellers and other groups of viewers. The assessment has involved three stages:

- Identification of the zone of theoretical visibility (ZTV) for the proposed overhead line;
- Field assessment of visual amenity, visual receptors and ground truthing of ZTV; and

- Assessment of magnitude of change and significance of effect on visual receptors.

Zone of Theoretical Visibility

The purpose of identifying the Zone of Theoretical Visibility (ZTV) is to show those areas from which the grid connection would theoretically be visible. The ZTV assumes a bare land surface taking no account of the screening effects of trees, hedgerows or buildings and is based upon theoretical visibility of the wood poles structures, which have a maximum height of 16m, at the locations shown in Figure 7.5 to 7.10.

The ZTV indicates locations from which each wood pole structure would theoretically be visible from its base to the top and from half height to the top. The ZTV does not show theoretical visibility of the conductors.

Whilst the ZTV may show that the development is theoretically visible from a location, this is not in itself indicative of the type of impact or magnitude of effect. The ZTV is therefore augmented by field work to consider the nature and composition of existing views, local landform and vegetation that may shield visibility of the proposed grid connection, and further analysis of potential extents of visibility. The ZTV has been generated from a Digital Terrain Model (DTM) using a Geographic Information System (GIS).

Several ZTV drawings have been generated to assist the interpretation and assessment of theoretical visibility of the scheme. The drawings are shown in Figures 7.5 to 7.10 and analysis of the extents of theoretical visibility is described in Section 7.4

Field Assessment of Visual Receptors

Viewpoints representing a range of receptors were visited and surveyed using a standardised checklist. Factors considered included:

- Receptor type and number (dwelling/commercial property/footpath/open space);
- Relative height to the development;
- Existing View (composition and quality);
- Distance of view;
- Percentage and elements of development potentially visible;
- Angle of view (acute/perpendicular/average);
- Composition of the view (i.e. the arrangement and proportions of features within the available view) and position of the development in the view; and
- Duration of view i.e. is the receptor static such as residents of housing, or mobile such as a pedestrian or vehicular traveller.

Assessment of Magnitude of Change and Significance of Effect

The evaluation and impact assessment involves consideration of the extent to which the proposed overhead line will change the composition of the existing view (magnitude of change) and the sensitivity to change based on the information gathered through site survey and analysis of the proposed development. Both criteria are represented using thresholds of magnitude or sensitivity: High, Medium, Low, Negligible and None (magnitude only).

The assessment of effects is presented as, firstly analysis of the extents of visibility of different sections of the line as indicated by the ZTV drawings; and secondly analysis of the effects upon each viewpoint as agreed in consultation with statutory authorities.

The viewpoint analysis is illustrated using a photograph of the existing view beneath which is provided a photomontage or a rendered model of the scheme within a computer generated landscape based on a 10m Digital Terrain Model. The photomontages and renders are shown in Figures 7.11 to 7.21.

Sensitivity of Visual Receptors

Visual receptors consist of people who would potentially have views of the proposed grid connection. The sensitivity of visual receptors depends upon:

- The location and character of the viewpoint;
- The activity of the receptor; and
- The importance of the view (which may be inferred by its inclusion as a viewpoint on an Ordnance Survey map or Guidebook).

Sensitivity to change considers the nature of the receptor, for example residents of a property are generally more sensitive to change than a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of how sensitive that receptor is to change.

In this assessment receptors are categorised in Table 7.4.

Table 7.4 Visual Sensitivity Criteria

High Sensitivity	Where the changed landscape is an important element in the view .
Medium Sensitivity	Where the changed landscape is a moderately important element in the view .
Low Sensitivity	Where the changed landscape is a less important element in the view .

Magnitude of Change

Magnitude of change considers the extent of development visible, the percentage of the existing view newly occupied by the development, the influence of the development within the view and viewing distance from the receptor to the development. The magnitude of effect upon visual receptors is assessed using the criteria listed in Table 7.5 below:

Table 7.5 Visual Impact Magnitude Criteria

High Magnitude	The development would cause a considerable change in the existing view
Medium Magnitude	The development would cause a very noticeable change in the existing view
Low Magnitude	The development would cause a noticeable change in the existing view
Negligible Magnitude	The development would cause a barely discernible change in the existing view
None	No change

Assessment of Impacts

A visual impact rating for each receptor is derived from consideration of the magnitude of change and sensitivity to change. Significance of impact is given the rating of major, moderate, minor, negligible or none. The impacts of the proposed overhead line are considered to be adverse unless otherwise stated.

Impacts of moderate and above are considered to be significant, as this is the level at which changes would be clearly perceived.

In terms of ratings for sensitivity, magnitude and impacts the thresholds identified above represent points on a continuum. Where appropriate intermediate ratings are used to indicate impacts at the higher or lower end of a particular threshold. For example, low to medium would represent an impact towards the higher end of the lower threshold. Medium to low would represent a rating at the lower end of the medium threshold. Impacts are assessed as adverse unless otherwise stated. Effect significance criteria are described in Table 7.6.

Table 7.6 Assessment of Impact Significance (Visual)

Type of Impact	Rational for Assessment
Major Impact	The proposal would cause widespread deterioration in the existing view**.**
Moderate Impact	The proposal would cause a very noticeable deterioration in the existing view.
Minor Impact	The proposal would cause a noticeable deterioration in the existing view.
Negligible Impact	The proposal would cause a barely perceptible deterioration in the existing view.
None	No change.