

9.6 Mitigation

Breeding Birds

To reduce the effects of construction noise and human disturbance on breeding birds, construction should be completed outside of the breeding season (March to August), however, given the anticipated construction programme some construction activities may occur within this period.

In order to ensure compliance with the Wildlife and Countryside Act 1981 (as amended) by preventing disturbance of nesting birds a number of mitigation measures would be put in place:

- If tree felling is considered necessary within the bird breeding season, a breeding bird survey by a suitably qualified ecologist will be undertaken.
- Pre-construction surveys will be undertaken to identify the any breeding birds nesting or present within or close to working areas.
- Construction works will be programmed to avoid disturbance during periods or in areas identified as being particularly sensitive following pre-construction surveys. This will include working on different sections of the overhead line for the duration of the sensitive period.
- Where possible tree felling or vegetation clearance required to facilitate construction and operation of the grid connection will be undertaken outwith the breeding season.
- Where tree felling or vegetation clearance is required during the breeding season it will only be undertaken following a detailed breeding bird survey by a suitably qualified ecologist.
- Construction activities will be undertaken within defined areas to limit disturbance and will occur within set working hours so as to not impact on birds at dawn or dusk. Advice on appropriate working methods and standoff distances from sensitive areas, such as nesting sites of would be provided by a suitably qualified ecologist.
- Should any Schedule 1 species or active Schedule 1 nest sites be identified during construction all works will be suspended within that area and advice sought from a suitably qualified ecologist on the most appropriate course of action.
- Where construction works have the potential to affect active nest sites a suitably qualified ecologist will supervise construction works.
- Micrositing of wood pole structures to avoid the wetter areas of wet modified blanket bog and marsh/marshy grassland.

Wintering Birds

Ecological Input to Route Design

Where pre-construction surveys indicate that wood pole structures would result in an impact on wintering bird interest, they would be microsited to avoid or reduce impacts. With regard to birds identified during the wintering VP surveys, there are no ornithological constraints associated specifically with the proposed route.

Disturbance from Construction

To reduce the impact of disturbance on wintering birds, areas required for construction works, storage of materials or access would be minimised as much as is practicable.

Displacement

The impacts of displacement on birds are anticipated overall to be at worst minor adverse and changes to the proposed route are unlikely to reduce this impact assessment, therefore no further mitigation is proposed.

Collision with Overhead Lines and Poles

The impact of collision with overhead lines and poles on birds recorded during the wintering VP surveys is anticipated to be minor adverse. The risk of collision may be reduced further by making the overhead lines more visible to birds.

Bird diverters/flappers are available which can be attached to overhead lines and which spin and reflect light, and can also glow in the dark to make the overhead lines visible to nocturnal species such as owls. Due to the low risk of collision bird diverters are not proposed to be installed, however, should pre-construction surveys indicate an increased risk of collision then bird diverters would be installed as appropriate.

It has also been found that reducing the number of vertical wires (i.e. removing the earth wire) can reduce the number of collisions of ptarmigan by approximately half, and that this mitigating effect should apply to all bird species susceptible to collision with overhead wires (Bevanger and Brøseth, 2001). Whilst for safety reasons the earth wire cannot be removed the design of the of the wood pole structures are such that the number of vertical wires required is minimised.

9.7 Residual Impacts

Breeding Birds

The principle potential impact on breeding birds is disturbance due to construction activities. As much as possible construction will be undertaken outwith the breeding period, however, where this is not possible mitigation measures including pre-construction surveys and appropriate supervision will be put in place.

Once constructed, the permanent and operational effects relate to collision risk which is considered to be minimal, and to a lesser extent the loss of habitat. With regard to displacement due to habitat loss; significant effects are not predicted to result because of the small scale footprint of the wood pole structures.

Residual effects on breeding bird species during the construction period and once the overhead line is operation all are summarised in Table 9.11.

Table 9.11 Significance of Impacts on Breeding Valued Species

Phase	Species	Value/Sensitivity	Magnitude of Impact	Significance of Residual Impact
Construction	Hen harrier	National/High	Minor Negative	Minor Adverse
	Merlin	National/High	Minor Negative	Minor Adverse
	Peregrine	National/High	Minor Negative	Minor Adverse
	Oystercatcher	Local/low	Minor Negative	Minor Adverse
	Golden plover	National/High	Minor Negative	Minor Adverse
	Lapwing	Local/Moderate	Minor Negative	Minor Adverse
	Snipe	Local/ Low	Minor Negative	Minor Adverse
	Curlew	High local/ Low	Minor Negative	Minor Adverse
	Redshank	Local/low	Minor Negative	Minor Adverse
	Short-eared owl	National/High	Minor Negative	Minor Adverse
Operation	Hen harrier	National/High	Neutral	Minor Adverse
	Merlin	National/High	Neutral	Minor Adverse
	Peregrine	National/High	Neutral	Minor Adverse
	Oystercatcher	Local/Low	Neutral	Minor Adverse
	Golden plover	National/High	Neutral	Minor Adverse
	Lapwing	Local/Moderate	Neutral	Minor Adverse
	Snipe	Local/low	Neutral	Minor Adverse
	Curlew	High local/ Low	Neutral	Minor Adverse
	Redshank	Local/Low	Neutral	Minor Adverse
	Short-eared owl	National/High	Neutral	Minor Adverse

Wintering Birds

If the mitigation proposed above is implemented, the impacts from the proposed overhead lines will be reduced (although this has only been assessed for species recorded during the wintering VP surveys); this can be seen in Table 9.12 below. The residual impacts are low, with the overall impact of the proposed overhead lines on ornithology being at worst **Minor Adverse**.

The effects of disturbance on wintering bird species (assuming construction is undertaken in winter) for all species (including raptors, wildfowl, waders and passerines) has been cautiously determined as having a **Minor Adverse** and therefore **Not Significant** effect.

The effects of displacement are considered to be **Minor Adverse**, however, it is likely in the case of most raptors (Buzzard, Kestrel, Sparrowhawk and Merlin) that they would use the wood poles as hunting perches.

Based on the results of the wintering bird surveys collision risk effects are predicted to be **Minor Adverse** and therefore are **Not Significant**.

Table 9.12 Significance of Impact on Wintering Bird Species

Impact	Ecological Impact Significance without Mitigation	Mitigation	Residual Ecological Impact Significance with Mitigation
Disturbance during construction.	1. Minor Adverse for all species recorded during the wintering VP surveys.	1. Complete construction within a given timescale and adhere to working areas.	No change – temporary Minor Adverse for all species.
Displacement (presence of the overhead lines)	1. Minor Adverse for lapwing, peregrine, curlew, golden plover, grey heron, pink footed goose, mallard, goosander, hen harrier, oystercatcher, red grouse and teal. 2. No effect for all other species.	1. No effective mitigation proposed - changes to the proposed route are unlikely to reduce this Impact assessment.	No change.
Displacement (barrier to movement)	1. No effect for all species.	1. No mitigation required.	No change.
Collision with Overhead lines and wood poles	1. Minor Adverse for all species.	1. Keep the number of vertical wires to a minimum.	Minor Adverse.

9.8 Summary

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.

With respect to breeding bird species the major potential impacts 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.

10. Cultural Heritage & Archaeology

10.1 Introduction

This chapter of the ES presents the results of the assessment of cultural heritage for the proposed scheme. The baseline archaeological conditions are described, together with an assessment of the potential effects and impacts of the proposed overhead line. Mitigation measures to be included within the design and construction proposals are described and mitigation is taken into account in the assessment of the overall residual impact.

10.2 Methods

Scope of Assessment

The scope of the assessment was to:

- Determine the presence of known archaeological and built heritage sites that may be affected by the proposed overhead line;
- Assess the likely potential of finding previously unrecorded archaeological remains during the construction programme;
- Determine the impact upon the setting of known cultural heritage sites in the surrounding area; and
- Identify mitigation measures based upon the results of the above to avoid, reduce or offset adverse effects.

A study area of 250m either side of the proposed overhead line has been assessed. This was undertaken to gain an understanding of the nature of the surrounding archaeological landscape.

Policy Context

National legislation and guidance which is relevant to cultural heritage includes:

- Ancient Monuments and Archaeological Areas Act 1979
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997
- Scottish Planning Policy 23 Planning and the Historic Environment
- Planning Advice Note 42 Archaeology - the Planning Process and Scheduled Monument Procedures (1994)

Regional and local planning policies which are relevant to the consideration of cultural heritage include:

- South Lanarkshire Council Local Plan (adopted June 2006) Policy ENV 22, Policy ENV 23, Policy ENV 24, Policy ENV 27

- The Glasgow and Clyde Valley Structure Plan Third Alteration 2006.

Consultation

In order to confirm the scope of this assessment and obtain baseline information, consultation has been undertaken with Historic Scotland, Royal Commission for Ancient and Historic Monuments Scotland and the West of Scotland Archaeological Service.

Information Sources Consulted

This chapter has been prepared in accordance with the guidelines from the Institute for Archaeologists. The sources consulted were:

- West of Scotland Sites and Monuments Record;
- Historic Scotland for Scheduled Monuments, Listed Buildings and Registered Gardens and Designed Landscapes;
- Scottish Historic Environment Policy;
- PastMap website and database (www.pastmap.co.uk) for the National Monuments Record;
- Royal Commission on the Ancient and Historical Monuments of Scotland;
- National Library of Scotland;
- Lanark Local Studies Library;
- Plans and maps of the study area and its environs; and
- Available aerial photographs.

A full list of the documents consulted can be seen in the references.

Walkover Survey

The walkover survey was undertaken between 15th and 16th August 2007. The weather conditions were variable and included bright, sunny weather, heavy showers and overcast skies.

The majority of the proposed overhead line route was traversed, however, some sections such as those within the former opencast at Dalquhandy and commercial plantation were not surveyed. It is likely that the mining and reinstatement of Dalquhandy has resulted in the loss of unrecorded archaeological features and remnants of the historic landscape. Plantation between the former Dalquhandy open cast coal mine and Douglas West could not be penetrated along the proposed overhead line. This commercial woodland is densely planted and the land appeared to have been cleared prior to planting.

The height of vegetation, particularly on moorland may have obscured slight earthworks and variations in topography.

Assessment Methodology & Significance Criteria

No standard method of evaluation and assessment is provided for the assessment of impact significance upon cultural heritage. Therefore, a set of evaluation and assessment criteria have been developed using a combination of the Secretary of State's Criteria for Scheduling Monuments, Design Manual for Roads and Bridges (DMRB) guidance on Cultural Heritage and Transport Analysis Guidance (TAG).

The criteria for designating cultural heritage sites (e.g. Secretary of State's Criteria for Scheduling Monuments, PPG 16 Annex 4), in conjunction with professional judgement, can be used to assess the value on all archaeological sites and monuments, historic buildings, historic landscapes and other types of historical site such as battlefields and parks and gardens, not just those that are statutorily designated. The approach to assessing value is presented in the table below.

Table 10.1 Determining Cultural Heritage Value

Value	Examples
Very High	<ul style="list-style-type: none"> • World Heritage Sites; • Assets of acknowledged international importance; • Other buildings of recognised international importance; and • Historic landscapes of international sensitivity, whether designated or not.
High	<ul style="list-style-type: none"> • Scheduled Monuments; • Undesignated sites/features of schedulable quality and importance; • Listed Buildings; • Undesignated structures of clear national importance; and • Designated & undesignated historic landscapes of outstanding interest.
Medium	<ul style="list-style-type: none"> • Sites/features that contribute to regional research objectives; • Unlisted buildings that can be shown to have exceptional qualities in their fabric or historical association; • Historic townscape or built-up areas with historic integrity in their buildings, or built settings; and • Designated special historic landscapes and undesignated historic landscapes of regional sensitivity.
Low	<ul style="list-style-type: none"> • Undesignated sites/features of local importance; • 'Locally Listed' buildings and unlisted buildings of modest quality in their fabric or historical association; and • Historic landscapes whose sensitivity is limited by poor preservation and/or poor survival of contextual associations or with specific and substantial importance to local interest groups.

Value	Examples
Negligible	<ul style="list-style-type: none"> Assets with very little or no surviving archaeological interest; Buildings of no architectural or historical note; buildings of an intrusive character; and Landscapes with little or no significant historical interest.
Unknown	<ul style="list-style-type: none"> Archaeological sites/features where the importance of the resource cannot be ascertained; and Buildings with some hidden (i.e. inaccessible) potential for historic significance.

The magnitude of the potential impact is assessed for each site or feature independently of its archaeological or historical value. The impact magnitude categories are adapted from the Transport Assessment Guidance (TAG Unit 3.3.9) and DMRB and are presented in Table 10.2 below.

Table 10.2 Determining Magnitude of Impact

Impact Magnitude	Examples
Major	Change to most or all key archaeological/historic building/historic landscape elements, such that the resource is totally altered. Comprehensive or total changes to setting.
Intermediate	Changes to many key archaeological/historic building/historic landscape elements, such that the resource is clearly modified. Considerable changes to setting.
Minor	Changes to key archaeological/historic building/historic landscape elements, such that the asset is slightly altered. Slight changes to setting.
Negligible	Very minor changes to elements or setting.
No Change	No change.

An assessment of the predicted magnitude of impact is made both prior to the implementation of mitigation and after the implementation of mitigation to identify residual impacts. This demonstrates the effectiveness of mitigation and provides the framework for the assessment of significance which takes mitigation measures into consideration.

By combining the value of the cultural heritage resource with the predicted magnitude of impact, the significance of the impact can be determined. This is undertaken following Table 10.3 below. The significance of impacts can be beneficial or adverse.

Table 10.3 Assessment of Impact Significance

Sensitivity	Magnitude				
	Major	Intermediate	Minor	Negligible	No Change
Very High	Major	Major	Moderate	Minor	None
High	Major	Moderate	Moderate	Minor	None
Medium	Moderate	Moderate	Minor	None	None
Low	Minor	Minor	None	None	None
Negligible	Minor	None	None	None	None

Where a choice of two impact significance descriptors is available only one should be chosen. This allows for professional judgement in assessing impacts on cultural heritage assets. To aid in the assignment of significance, significance criteria have been developed to enable effective and transparent discrimination between categories. These can be seen in Appendix G.

10.3 Baseline Situation

Overview

The West of Scotland Sites and Monuments Record (SMR) holds information for 20 archaeological sites and the National Monuments Record of Scotland holds information for one additional site within the study area. A further 23 sites were identified from analysis of historic mapping and aerial photographs and from the walkover survey. Historic Scotland's records do not identify any sites within the study area and no archaeological interventions have been recorded.

Full site descriptions and locations of sites can be seen in Appendix H. Within this Chapter, the bracketed numbers after site descriptions relate to those allocated to individual sites in Appendix H and on Figure 10.1 (sheets 1 and 2).

There are no World Heritage Sites, Scheduled Monuments, listed buildings, Registered Gardens and Designed Landscapes or Conservation Areas within the immediate vicinity of the overhead line.

The nearest Scheduled Monument is located on Auchensaugh Hill 1.8km north east of the proposed overhead line. There are a number of listed buildings within Douglas which combined form the Douglas Conservation Area, however these are all over 2km away from the proposed overhead line.

Prehistoric (up to 80 AD)

There are no known sites of prehistoric date within the study area.

Roman (80 AD – 410AD)

There are no known sites of Roman date within the study area. However, there is some evidence that a road ran between Crawfordjohn in the south and Castledykes in the north. The route of this road is uncertain and it may

have followed the of the B7078, although it may also have veered further west into the study area. A study undertaken in 1972 also suggested the presence of a road dating to the Roman period that ran east/west across the study area. The road is thought to cross the proposed line just to the south of Earls Mill and then continue across the moor in a north west direction towards Douglas. No evidence for this road was recorded in this location during the walkover survey.

Early Medieval (450 AD – c.1066 AD)

There are no recorded sites of early medieval date within the study area.

Medieval (c.1066 AD – c.1500 AD)

The only recorded site of possible medieval date within the study area is an area of rig and furrow cultivation (5), though this might also date to the post-medieval period. In addition to this recorded site, areas of rig and furrow were noted across the upland areas of the region on aerial photographs. Many of these areas fall outside of the study area, but indicate medieval settlement and cultivation within the district.

In addition to these sites the village of Douglas was established in the 13th century at the same time as the castle was built. Lesmahagow priory, to the north of the study area, was also established at this time.

Post-Medieval (c.1500 AD – 1900 AD)

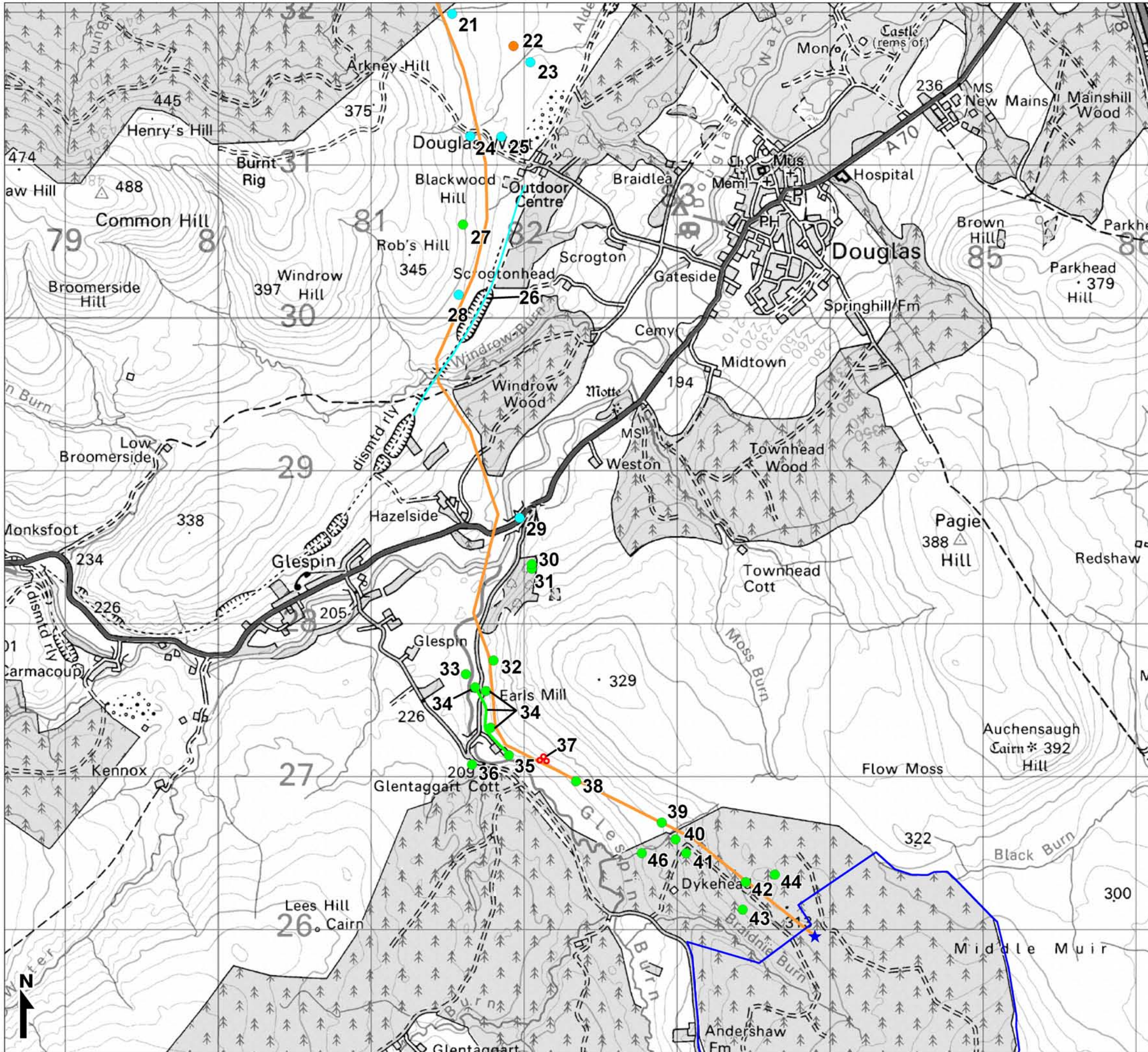
The study area is depicted by historic maps throughout the post-medieval period, which improve markedly in terms of accuracy and detail from the mid-19th century. This later mapping, together with aerial photography, has proved the principal means of identifying archaeological sites within the study area.

The earliest survey viewed for this assessment is Blaeu's map of 1654. Douglas is recorded as "Dowglas" with the image of a castle: there is no further detail of the buildings or the landscape.

William Roy undertook a military survey of Scotland between 1747 and 1755. Earls Mill and Hazelside are both shown on this map. The approximate line of the "Cole burn" is shown, along with a possible settlement that is obscured by the loss of detail at the fold in the map. One significant feature is a road marked as "road from Crawford John to Douglas". This road is shown as crossing the study corridor to the south east of Auchensaugh Hill and carrying on north to Douglas. The modern OS mapping shows a footpath at this approximate location. However, no evidence of this road or the footpath was identified during the walkover survey of this area.

William Forrest produced a map in 1816 from his own surveys undertaken of the County of Lanark. This map shows many of the features identified by Roy in the 1740s including the road running from Crawford John to Douglas. On Forrest's map only villages of a reasonable size, such as Douglas, are depicted in any detail. The name of Coalburn is shown on the map with a small square which probably indicates a small settlement of no more than a few houses. There is also some indication of early mining and quarrying works in the areas to the south and south west of the Coalburn.

The first edition Ordnance Survey map for this area was surveyed in 1858 and published in 1864. The second and third edition OS maps date to 1898 and 1912 respectively. The features identified from these maps relate to the pastoral and industrial development of the study area and associated settlement. A number of farmsteads and other domestic buildings are depicted on these maps (1, 2, 3, 4, 5, 29, 30, 31, 32 & 36), some of which were already ruinous by 1858. Sheep rees (banked or walled enclosures for herding sheep) are common across the landscape and five of these were noted within the study area (13, 21, 22, 23, 28 & 38). A further seven sites relate to mining (6, 12, 15, 17, 18, 35 & 44), two to limekilns (11 & 33)

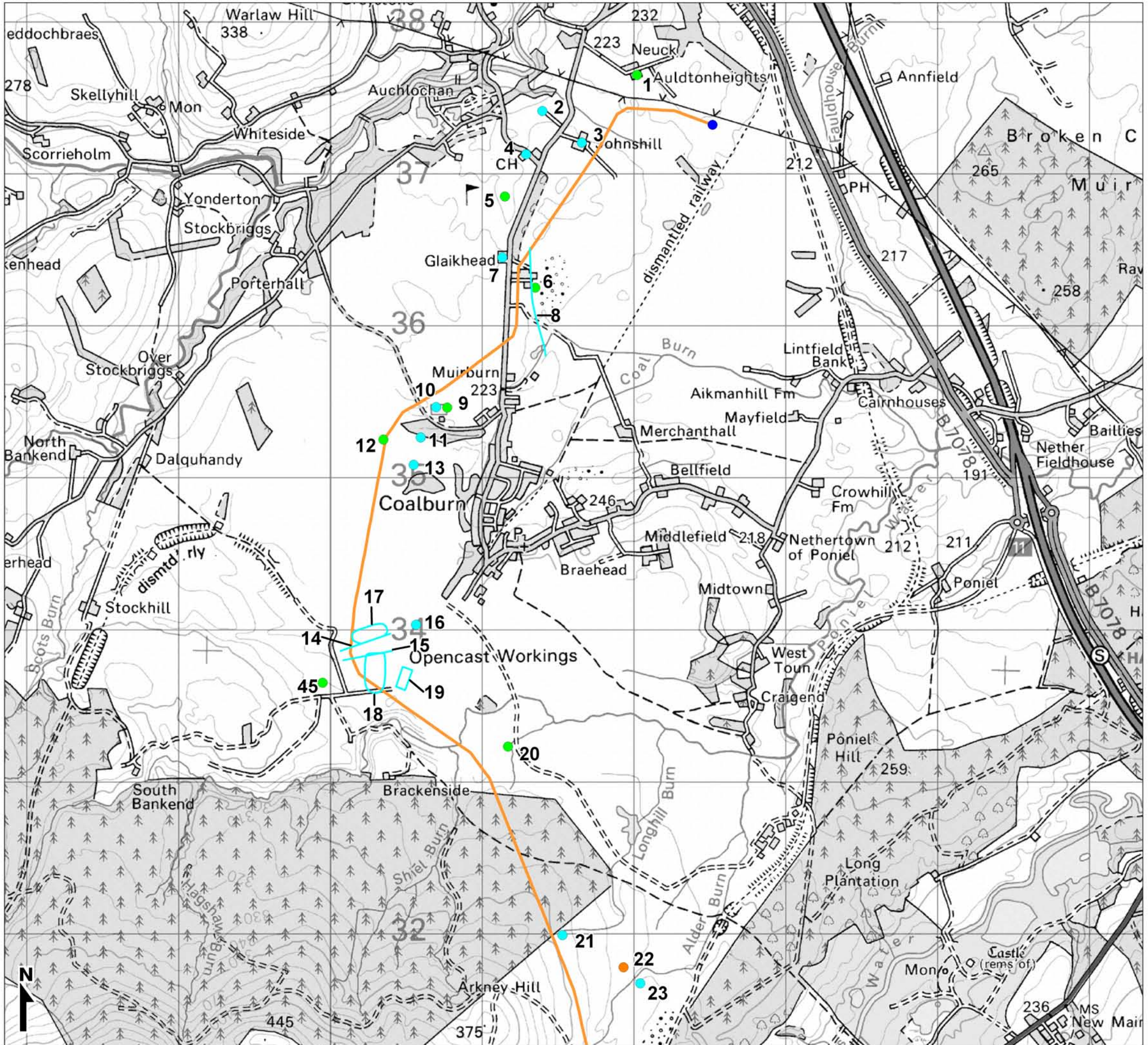


Legend

- Proposed Overhead Line Route
- Andershaw Substation
- Andershaw Boundary
- Coalburn Substation
- Cultural Heritage Feature
- Site Identified from Historic Mapping
- Site Identified from Aerial Photograph
- Site Identified on Walkover Survey

Project	Andershaw - Coalburn Proposed 132kV Overhead Line		
Title	Figure 10.1: Known Cultural Heritage Features Sheet 1 of 2		
Scale	1: 25,000	Drawn by	DAM
Date	Jan '09	Checked by	JL
			Rev. -

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- Legend**
- Proposed Overhead Line Route
 - ★ Andershaw Substation
 - Andershaw Boundary
 - Coalburn Substation
 - Cultural Heritage Feature
 - Site Identified from Historic Mapping
 - Site Identified from Aerial Photograph
 - Site Identified on Walkover Survey



Project	Andershaw - Coalburn Proposed 132kV Overhead Line		
Title	Figure 10.1: Known Cultural Heritage Features Sheet 2 of 2		
Scale	1: 25,000	Drawn by	DAM
Date	Jan '09	Checked by	JL
			Rev. -

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and two to milling (10 & 12). Mineral railways and tramways were present, notably in the northern section of the study area, linking the collieries and the main line railway (8, 14 & 15).

The second (1898) and third (1912) edition maps are particularly useful in showing the development of the large collieries in the study area. Some features appear or are named on the first edition, but a number of these are not included on the second edition. This demonstrates the short-lived nature of these features, and the rapidly-altering character of the mining sites as a whole. At the close of the 19th century all the major colliery sites had opened, but many appear to have expanded dramatically by the time that the third edition was surveyed.

The mapping for this area was not updated again until the early 1990s.

Modern (1900 AD – present)

The repair and rebuilding of agricultural features is commonplace and many extant features such as walls and enclosures may have earlier origins.

A rifle range was noted on Ordnance Survey mapping. The complex included the shooting points (24) and targets placed at 100 yard intervals (25).

The industrial economy of the area continued to grow throughout the modern period and continued to be based largely on coal mining, particularly in the north and west of the study area. Many of the post-medieval collieries continued in use and new features were built to support them such as pump houses and drainage ponds (10).

Site of Unknown Date

There are several sites of unknown date within the study area. Prehistoric origins cannot be ruled out for these sites although they may be of later date. These include a small circular depression, banked on its downslope side (27). This feature is of indeterminate origin, but it may represent a dried up pond created as a water source for livestock or early quarrying.

Two complexes of earthworks including two oval huts, two small huts or middens, a turf house, hollow way and stone fold (39) and a circular enclosure and banks (40) of uncertain date are recorded. However, neither were observed during the walkover survey and no further information is available. The complex of huts, middens and hollow way (39) may have been masked by vegetation on the moorland, although the enclosure and banks (40) may have been removed by the installation of the conveyor belt or damaged by forestry planting.

Several previously unrecorded sites were identified during the walkover survey. Although the date of these is most likely to be post-medieval, prehistoric origins cannot be ruled out. The first of these sites comprises a group of small pits, observed on the moorland above Glentaggart colliery (37). These are most likely to be remnants of small scale mining activities in the area.

Historic Landscape

The historic landscape is diverse and reflects the changing economy of the area. The agricultural base of the area is reflected by lowland enclosure of land. These fields are predominantly improved pasture and are turned over to grazing for cattle and sheep. The field boundaries within the study area are mixed and include stone walls and post and wire fence.

As the height above sea level rises the nature of the landscape changes to moorland. In some areas, such as Earls Mill, the 'head dyke' is a clearly defined boundary marking the transition from managed farmland to moorland. The moorland varies in character and vegetation including areas

of long grass, heather and mire. This type of landscape is predominant along the southern section of the route.

Pine and conifer woodland dominate within the study area. These areas of woodland are densely planted and it is very difficult to penetrate the forest outside of the forestry trackways. Where substantial earthworks or stone structures (e.g. sheepfolds) are extant they are likely to be planted around. Slight earthworks and buried archaeological features are, however, likely to have been removed by the planting and harvesting process and disturbed by tree roots.

The industrial heritage of the area is also a prominent feature of the landscape. Coal mining has formed an important part of the economy of this area since the late post-medieval period. Coalburn open cast mine was the largest open cast mine in Europe. This mining has led to substantial areas of landscape being recreated and reinstated after the exhaustion of the minerals. Across the study area this is particularly visible in the northern section of the route.

Associated with the mines are industrial features which support their operation. There are several dismantled railways within the area which would have facilitated the transport of coal away from the mine. There is also a substantial conveyor belt for transporting coal from the working Glespin mine across the valley, Andershaw Hill and plantation, and across Middle Muir to Mid-Rig where it continues its journey by lorry. This conveyor belt is of recent construction and includes an adjacent gravel access track. It forms a substantial linear feature across the landscape.

Settlement within the study area and immediate landscape is largely composed of scattered hamlets and isolated farmsteads. Coalburn village grew as a response to the open cast mine and a need for housing for mine workers. Douglas has earlier origins and its growth is likely to have been due to the opportunity to cross the river in this location. Douglas was established by the 13th century around the castle, the remains of which are still visible to the north east of the town.

Walkover survey

The walkover survey identified a single unrecorded site, this being a group of possible mining pits (37).

Aerial photographs

Aerial photographs dating between 1946 and 1989 were examined for this assessment. A sheepfold (22) was identified by this exercise, whilst the presence of sites shown on historic maps was also confirmed.

10.4 Assessment of Effects

Construction Effects

Potential Impacts

In the assessment of construction effects, it is assumed that all cultural heritage sites identified by the baseline survey and walkover are still in existence. In reality this may not be the case, especially within working and former opencast coal sites, but due to topography vegetation and land access, it has not been possible to verify site condition in many instances.

Construction effects will arise from the following:

- Installation of wood pole structures to carry the overhead lines;
- Creation of temporary access tracks; and

- Felling of trees to create wayleaves.

It is assumed that features located within 10m of the proposed overhead line would be affected during construction activities. This 10m wide corridor allows for construction activities, access and potential micro-siting of wood pole structures. Within this corridor features could be disturbed or, in the worst case scenario, permanently lost or removed, however, this assumption omits the possibility that individual sites may already have been permanently removed – a distinct possibility particularly within areas of commercial woodland or opencast coal mining. Discrete features which occupy a small area within 10m (for example sheepfolds or individual buildings) could be permanently lost or removed during construction, whilst more extensive features could be affected within the corridor but undisturbed beyond that point.

Mitigation

Where known archaeological or heritage features are present wood pole structures will be micro-sited to avoid such interests. Vulnerable features may be demarcated to avoid damage from construction traffic. The span of the wood pole structures, typically 60 – 80m, will mean that some features are spanned by the proposal and thus avoided.

Where sites are affected, an archaeological watching brief will be maintained during topsoil removal for wood pole structure construction and installation of temporary access. Any heritage features affected would be recorded.

Residual Impacts

Table 10.4 summarises the predicted residual impacts relating to construction. A total of 12 features are considered to be affected.

Five small, discrete sites along the route of the overhead line are predicted to be impacted upon. These comprise three sheep rees (28, 38 & 42), an abandoned shieling complex (39), and an isolated structure that was already ruinous when it was depicted on early OS mapping (32). All sites are of negligible cultural heritage value. The impact magnitude is predicted to be major negative, however, given the negligible sensitivity the impacts are **Not Significant**.

Seven other sites fall partially within 10m of the proposed overhead line. These comprise four former colliery sites (12, 17, 18 & 35), a group of former mining pits (37) and stretches of a mineral railway (14) and mineral tramway (15). In each instance a significant proportion of the site or feature lies outside of the 10m buffer, and so the magnitude of impacts are predicted as being either intermediate or minor negative. It should be noted that sites 14, 15, 17 and 18 are clustered within an area of opencast workings, and their survival within the modern landscape is considered to be dubious.

Table 10.4 Summary of Construction Effects

Site No.	Site Name / Description	Value	Impact Magnitude	Impact Significance
12	Coalburn Coal Mine	Low	Intermediate Negative	Minor Adverse
14	Caledonian Railway Track, Lesmahagow Branch	Low	Minor Negative	Minor Adverse
15	Tramway	Low	Minor Negative	Minor Adverse
17	Dalquhandy Colliery Pits 1 and 2	Low	Minor Negative	Minor Adverse
18	Westtown Colliery Pits 1 and 2	Low	Minor Negative	Minor Adverse
28	Sheep ree	Negligible	Major Negative	None
32	Unroofed structure	Negligible	Major Negative	None
35	Glentaggart Colliery	Low	Minor Negative	Minor Adverse
37	Possible mining pits	Negligible	Intermediate Negative	Minor Adverse
38	Sheep ree	Negligible	Major Negative	None
39	Depopulated Settlement or shieling group	Negligible	Major Negative	Minor Adverse
42	Sheep ree	Negligible	Major Negative	None

There is the potential for previously unrecorded archaeological sites to be discovered during construction. As the exact nature of any such sites is currently unknown the magnitude of impact cannot be determined at this stage. However, if any such sites are discovered the magnitude of impact is likely to be major negative as they would be removed or lost during construction.

Permanent and Operational Effects

Potential Impacts

The permanent and operational effects of the development may be considered under three headings: direct physical; indirect physical; and indirect visual.

Direct physical impacts have been discussed above, in relation to construction. Because of the nature of the archaeological resource, such impacts are usually confined to the construction period, as opposed to the operational phase of a development.

Indirect physical impacts take a number of potential forms. These include the destabilisation of the preserving environment for nearby archaeological sites, severance of historic land parcels, disturbance to historic land use, and prevention of access leading to a reduced ability to manage a site or a reduction in its amenity value.

Indirect visual impacts relate to the alteration of the essential setting of sites and monuments, particularly with reference to key viewpoints, and to visual connections between historically-linked elements. Legislation and guidance renders setting a material concern for Scheduled Monuments, listed buildings, Registered Gardens and Designed Landscapes and Conservation Areas. However, although these are the principal site-types for which setting must be considered, SPP 23 specifies that the setting of regionally and locally important sites also be considered.

Mitigation

During the development of the proposed overhead line avoidance of Scheduled Monuments, listed buildings, Registered Gardens and Designed Landscapes and Conservation Areas was a key consideration.

There are no predicted direct or indirect physical impacts arising from the proposed development. No further mitigation is therefore necessary.

Residual Impacts

There will be no direct physical impacts arising from the operation of the proposed development.

There will be no indirect physical impacts arising from the operation of the proposed development.

The proposed development has the potential to alter the visual setting of cultural heritage sites, and the character of the historic landscape as a whole. The Zone of Theoretical Visibility (ZTV) for the proposed development suggests that it will be visible over a broad area (see Chapter 7 Landscape and Visual Amenity Figure 7.5).

However, the ZTV is based on elevation only and assumes "bare" ground/ It does not take in account vegetation, building heights and such like. The reality is that views of the overhead line will be significantly restricted, particularly by the areas of forestry along, and immediately adjacent to the overhead line. Moreover, the proposed grid connection will be carried by wood pole structures, at a height of 16m above the ground. This form will be relatively unobtrusive where it crosses open ground, and where it passes through forestry it will be screened by the surrounding woodland.

No Scheduled Ancient Monuments, listed buildings, Registered Gardens and Designed Landscapes or Conservation Areas are present within the immediate vicinity of the overhead line. Due to the intervening distance, topography and vegetation no such sites are considered likely to be subject to a visual impact from the proposed development.

The cultural heritage sites identified within the study area are all of a non-statutory nature. Although this does not preclude consideration of their setting, in this case the issue is not relevant. The features are essentially utilitarian: they had a domestic, pastoral or industrial function, and as such there was no 'intent' to their setting, that is to say that views 'from' or 'to' these features were not a consideration at the time of their creation. Whilst they have a setting within their immediate environment, it is not considered that the presence of the overhead line will significantly degrade this 'land use setting', nor will it reduce a visitor's ability to understand and interpret them. As a result permanent impacts on the setting of such features are **Not Significant**.

The 'historic' character of the present landscape is already compromised by the presence of forestry, steel lattice tower lines, wind turbines, opencast coal mines and associated industrial features: it is, in fact, largely a creation of more recent date. The proposed development is of limited

scale and, as discussed above, its form is such that it will blend into the landscape. Although in places the overhead line may be viewed from some distance away, it will not be a major or prominent feature in the landscape. Its effect on the historic character of the landscape will be negligible and is **Not Significant**.

10.5 Summary

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 micro-sited 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 routing 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**.

11. Ground Conditions & the Water Environment

11.1 Introduction

This chapter of the ES describes the prevailing ground conditions along and adjacent to the proposed overhead line route as well as the existing hydrological character of the area.

The assessment considers the potential effects construction and operation of the overhead line may have on ground conditions and the water environment including soil erosion, reductions in water quality and changes to the hydrological regime. It identifies mitigation measures to be implemented to avoid, reduce and offset any adverse effects.

11.2 Methods

Scope of Assessment and Assumptions

The scope of the assessment has been developed based on the Scoping Opinion provided by the Scottish Government. The study area is largely based the route of the proposed overhead line including areas adjacent to the route corridor. The assessment also considers areas upstream and downstream of the development which may potentially be affected.

For the purposes of the assessment it has been assumed that stretches of watercourses adjacent to the proposed scheme are currently used as receiving watercourses for discharges from activities on land. It should be noted that no water quality monitoring was undertaken as part of this assessment.

Legislative and Policy Context

A qualitative assessment has been undertaken using a combination of professional judgment, legislation and other statutory policy and guidance. Key acts of legislation, policy and guidance which have been considered in the preparation of this assessment include:

- Water Framework Directive (2000/60/EC);
- Water Environment and Water Services (Scotland) Act 2003;
- The Water Environment (Register of Protected Areas) (Scotland) Regulations 2004
- Water Environment (Controlled Activities) (Scotland) Regulations 2005
- Scottish Planning Policy 7 (SPP7): Planning and Flooding;
- Planning Advice Note 61 (PAN61): Planning and Sustainable Urban Drainage Systems,
- CIRIA Document C650 Environmental Good Practice on Site;
- CIRIA Document C521 Sustainable Urban Drainage Systems – Design Manual for Scotland and Northern Ireland;

- SEPA Groundwater Protection Policy (Policy No. 19); and
- SEPA Pollution Prevention Guidelines.

Overview of Approach

Baseline conditions were established primarily via a desk study. Where such information was available, the desk study included the following:

- Identification of the locations and characteristics of catchments and principal water bodies close to the proposed overhead line;
- Identification of river classifications from the Scottish Environment Protection Agency (SEPA) for relevant waterbodies;
- Identification of the Water Framework Directive (WFD) reporting categories assigned to the surface waterbodies within the vicinity of the overhead line;
- Collation of information on climate, surface hydrology and flooding;
- Identification of hydrogeological conditions and groundwater resources; and
- Review of published maps including Ordnance Survey maps at 1:10,000 and 1:50,000, British Geological Survey (BGS) Maps of solid and drift geology, and Macaulay Land Use Research Institute maps illustrating soils and land capability for agriculture.

The findings of the desk study were supplemented by site walkover surveys. This included a visual inspection of surface watercourses adjacent to, or in close proximity to sections of the overhead line route.

Impacts Evaluation

The assessment methodology is based on guidance given in the IEMA publication “Guidelines for Environmental Impact Assessment”. Effects are assessed by predicting the changes that would be caused by the construction and operation of the grid connection in relation to the baseline situation.

In assessing the significance of potential effects of the proposed overhead line, three key factors have been taken into account:

- The **likelihood** of that impact occurring;
- The **sensitivity** and/or **importance** of the receiving environment; and
- The potential **magnitude** of the impact.

The likelihood of an effect occurring is based on a scale of certain, likely or unlikely. The sensitivity of the receiving environment i.e. its ability to

absorb an impact without perceptible change is defined below in Table 11.1.

Table 11.1 Sensitivity Criteria

Sensitivity	Criteria
High	Feature of international or national importance, for example a Special Area of Conservation (SAC) or Site of Special Scientific Interest (SSSI). High classification for water quality (i.e. A1 Excellent or A2 Good or Sensitive habitats of national importance). Critical social or economic uses such as for water supply, navigation or mineral extraction.
Medium	Feature of regional importance for example a Regionally Important Geological Site (RIGS). Moderate water quality (i.e. B Moderate). Sensitive habitats of regional importance. Limited social or economic uses.
Low	Feature of local or less than local importance. Heavily modified with poor water quality (i.e. C Poor or D Seriously Polluted). Habitats of local or less than local importance. Minimal economic or social uses.

The impact magnitude considers the scale of the predicted change to base-line conditions resulting from a given potential effect and takes into account the duration of an effect i.e. temporary or permanent and whether it is direct or indirect. Definitions are described in Table 11.2.

Table 11.2 Impact Magnitude Definition

Magnitude	Criteria
High	Fundamental change to geological resource, surface or groundwater quality or flow regime
Medium	Measurable change to geological resource, surface or groundwater quality or flow regime
Low	Minor change to geological resource, surface or groundwater quality or flow regime
Negligible	Very slight change to surface or groundwater quality or flow regime

A qualitative approach has been taken to the assessment broadly following the approach illustrated in Table 11.3 and also using professional judgement.

The significance of a given effect is based on a combination of the sensitivity or importance of the receptor and the magnitude of a given potential impact. Effects are identified as beneficial, adverse or negligible and their significance as major, moderate, minor or negligible.

The results of this assessment are presented as residual impacts; i.e. the impact remaining taking into account the mitigation measures that would be adopted through construction and operation of the overhead line. Mitigation has been developed based on current best practice and established standard and construction techniques.

Adverse effects may be predicted where the scheme is considered to negatively affect baseline conditions, for example a reduction in water quality or an increase in flood risk. Adverse residual effects identified as minor or negligible are considered to be environmentally acceptable; residual impacts assessed as moderate or higher are considered to be significant.

Beneficial effects may be predicted where the proposed overhead line is considered to result in an improvement to baseline conditions, for example a reduction in existing flood risk or an improvement in water quality.

Table 11.3 Assessment of Impact Significance

Sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Moderate	Moderate	Minor
Medium	Moderate	Moderate	Minor	None
Low	Moderate	Minor	None	None

11.3 Baseline Situation

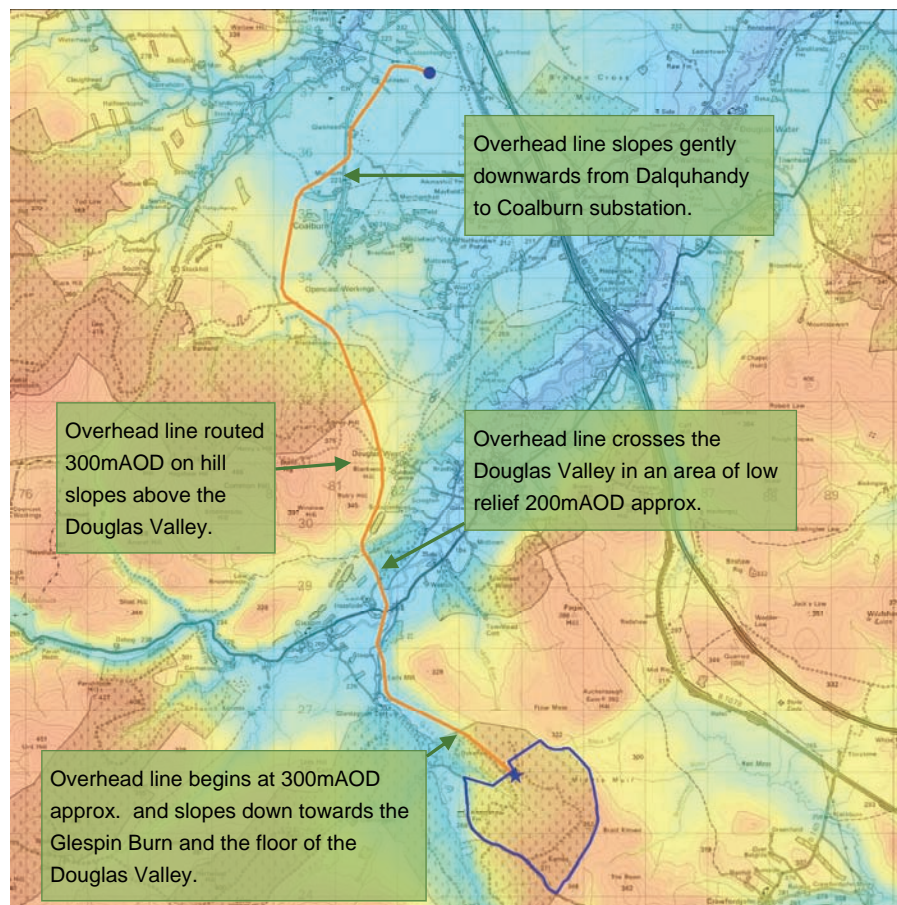
Topography and Climate

Topography and climatic conditions exert a considerable influence over the water environment, particularly rainfall and drainage patterns. As a linear scheme, topography along the proposed route of the overhead line, illustrated on Figure 11.1, is quite variable ranging roughly between 200m AOD and 320m AOD.

At Andershaw the southern section of the route traverses an elevated section before descending down the slopes of the Douglas Valley, crossing the valley floor and traversing upslope on the opposite side of the Douglas Valley. From here the route gently slopes downwards towards Coalburn substation.

Notable areas of high relief are in the southern and central sections of the route at Andershaw and Douglas West, north and south of the Douglas Valley respectively. Elevations here are typically between 280m and 300m AOD. The lowest section of the route is located within the valley floor where the route crosses the Douglas Valley; within this section elevations are around 200m AOD.

Figure 11.1 Topography



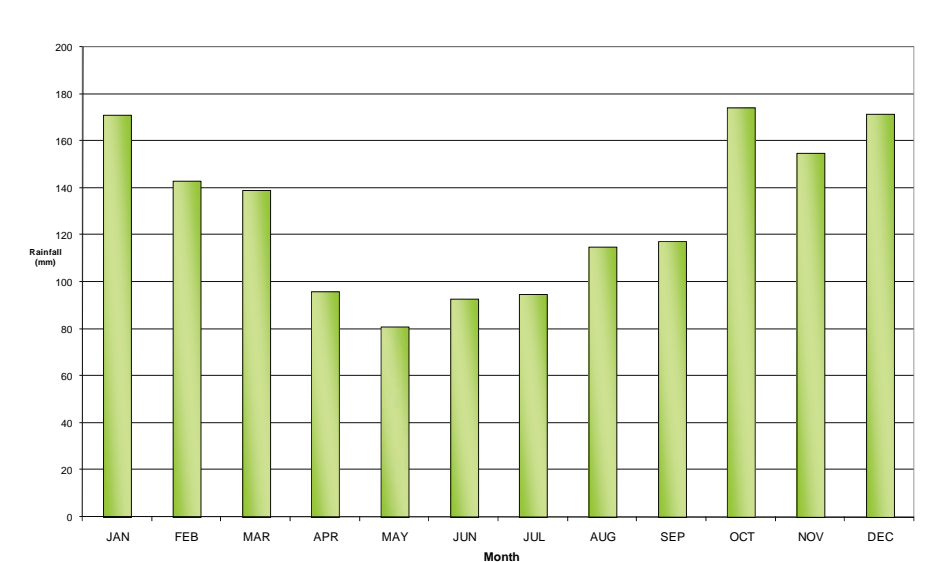
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The National River Flows Archive holds rainfall data for rain gauges across the UK including one on the Douglas Water at Happendon, approximately 4km east of the proposed overhead line connection. For the period 1961 to 1990 average annual rainfall at this location is 1241mm.

To put this into context with the south west of Scotland average annual rainfall data has been obtained from the Met Office. For the south west region, during the period 1987 to 2007 average annual rainfall is 1551mm. Rainfall records for the south west of Scotland have been reviewed and average monthly rainfall for the period within the same period are illustrated in Figure 11.2.

As would be expected the drier months of the year where rainfall is below 120mm tend to be between April and September with wetter months occurring January to March and October to December.

Figure 11.2 Average Monthly Rainfall 1987-2007



Surface Hydrology

The majority of the proposed overhead line lies within the catchment of the Douglas Water. It rises in hills to the west of the proposed scheme and flows in a broadly north easterly direction through the Douglas Valley until it eventually drains into the River Clyde. The proposed grid connection traverses the valley crossing from the southern to northern valley side, surface runoff tends to flow overland into the Douglas Water or its tributaries.

A number of smaller burns including the Glespin Burn, Windrow Burn and the Poniel Water are also either spanned or are adjacent to the proposed overhead line, however, these all drain directly into the Douglas Water. The confluence of the Glespin Burn with the Douglas Water is immediately adjacent to the proposed overhead line.

Forestry drains within commercial plantation at Andershaw and agricultural drains on field margins are also present in the areas traversed by the proposed grid connection scheme. These generally discharge to larger streams such as the Glespin Burn.

Water Framework Directive and Surface Water Quality

The WFD has been transposed into Scottish law by the Water Environment and Water Services Act (Scotland) 2003 (WEWS) and Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR).

The overall objective of the WFD is the 'protection of the water environment' which is transposed into s.1(2) a) of the WEWS Act as meaning preventing further deterioration of, and protecting and enhancing, the 'status' of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on those aquatic ecosystems'. The WFD goes on to define "Surface water status" as the general expression of the status of a body of surface water, determined by the poorer of its ecological status and its chemical status, Article 2(17).

The implementation of the WFD has resulted in the identification River Basin Districts (RBDs) and Significant Water Management Issues (SWMIs). The proposed overhead line is routed through the Scotland RBD which covers the majority of the country. SWMIs are identified as pressures and impacts upon the water environment that could compromise surface waters and the potential to achieve "good status".

The first characterisation of the Scotland RBD was undertaken in 2007. It identified the pressures and impacts on waterbodies within the RBD. At the same time heavily modified and artificial waterbodies were also identified and a Register of Protected Areas prepared.

A key consideration in identifying SWMIs is assessing if the waterbody is at risk of not achieving the WFD target of “good status” by 2015. A risk based approach, rather than the qualitative approach used for water quality classifications, is used to determine WFD characterisations. The risk status is determined taking into account pressures and impacts including; point source and diffuse pollution, abstractions, impoundments and hydromorphological change. Four reporting categories are used to describe all types of surface waterbodies:

- 1a definitely at risk of not achieving “good status” by 2015;
- 1b probably at risk of not achieving “good status” by 2015;
- 2a probably not at risk of not achieving “good status” by 2015; and
- 2b definitely not at risk of not achieving “good status” by 2015.

It should be noted that the characterisation took into account factors not previously considered in the assessment of river quality. This, coupled with the more stringent quality objectives of the WFD, means that the many surface waterbodies are deemed to be in categories 1a or 1b, at risk of not achieving “good status” even though they may have higher quality rating under the water quality classification regime.

Previously water quality classifications were determined taking into account biological, chemical and aesthetic elements of surface waters and a single classification resulted:

- A1 Excellent;
- A2 Good;
- B Moderate;
- C Poor; and
- D Seriously polluted.

It is SEPA’s intention that the above classifications will continue to be used for reporting until at least 2007 when they will be replaced by the WFD reporting categories. Where such information on water quality exists, this assessment has taken into account both the water quality classification, based on the sampling year 2006, and the results of the WFD characterisation within 2007. The results of both are set out below in Table 11.4.

Table 11.4 SEPA Water Quality Monitoring Results

Watercourse	River Basin District Characterisation (2007)	Water Quality Classification (2006)
Douglas Water	2b, definitely not at risk	A2, Good
Glespin Burn	2b, definitely not at risk	A1, Excellent

Watercourse	River Basin District Characterisation (2007)	Water Quality Classification (2006)
Poniel Water	1a, definitely at risk	B, Moderate

A number of surface watercourses, field drains and forestry drains are unmonitored. For the purposes of this ES water quality within those bodies which are unmonitored will be considered to be at least as good as the Douglas Water, the principal waterbody within the area.

Controlled Activities Regulations

The Controlled Activities Regulations (CAR) have resulted from the implementation of the WFD. CAR covers engineering works in or adjacent to waterbodies and aims to control the impacts of development on the water environment. There are three levels of CAR, General Binding Rules (GBRs), Registration and Licence. The control and authorisation conditions applied under these levels will be dependent on the risks a particular development poses to the water environment. The implications of CAR in relation to the scheme are addressed in terms of construction works and operation activities liable to cause pollution of surface waters.

Register of Protected Areas

As part of the implementation of the WFD SEPA has established a register of protected areas. It includes area protected under a range of existing legislation. The aim of the register is to ensure that waterbodies within these designated areas are managed to ensure that they achieve the objectives of the WFD. The register includes:

- Areas designated to protect economically significant species;
- Bathing waters;
- Nutrient sensitive areas;
- Areas designated for the protection of habitats or species; and
- Waters used for the abstraction of drinking water.

There are no areas on the Protected Area Register in the immediate vicinity of the proposed grid connection. The nearest is the River Clyde, designated for its salmonid interests.

Flooding and Flood Risk

The SEPA Indicative River and Coastal Flood Map (www.sepa.org.uk) illustrates areas estimated to have a 1 in 200 or greater chance of flooding each year. The proposed overhead line is routed over and adjacent to watercourses identified as being prone to flooding as well as their flood plains. Watercourses identified on the Flood Map include the Douglas Water, Glespin Burn and smaller tributaries. The route is considered likely to be subject to flooding where the Glespin Burn drains into the Douglas Water, however, this would be in rare extreme circumstances.

Geology

The proposed overhead line is routed within the southern part of an area known as the Midland Valley which lies between the Highland Boundary Fault and the Southern Upland Fault. The Midland Valley comprises

predominantly sedimentary rocks of Devonian and Carboniferous age. To the southern margin of the Midland Valley some igneous rocks, in the form of lavas and tuffs, are also present.

The southern section of the proposed overhead line is routed over undifferentiated andesitic lavas and tuffs, however the vast majority of the scheme is underlain by siltstones, sandstones, mudstones interspersed with beds of limestone, coal and fireclay. These formations belong to the Diantian, Namurian and Westphalian Successions. At the centre of the route at the Douglas Valley the coal seams of the Westphalian are well developed and have been extensively worked.

Drift deposits are present along the entire length of the proposed overhead line. The majority of the area is underlain by boulder clay, however, along the Douglas Valley drift deposits are dominated by alluvium and glacial sand and gravel. Peat is present on the upland areas where the wet conditions and cool temperatures are such that it has developed on the undulating ground. Peat depths are locally variable with shallower deposits present on slopes and deeper peat on flatter areas.

The underlying geology has exerted a considerable influence on the region’s landscape character and played an integral part in the economic and industrial development of South Lanarkshire. The latter is particularly evident with a number of former and current opencast coal mines and former oil shale bings located in close proximity to the proposed scheme.

Groundwater

The Groundwater Vulnerability Map of Scotland (BGS 1995) indicates that the proposed overhead line is predominantly underlain by moderately permeable bedrock with some pockets of weakly permeable strata.

The moderately permeable bedrock consists of fractured or potentially fractured rocks that do not have a high primary permeability, or formations of variable permeability. Large quantities of water are rarely extracted from moderately permeable bedrock, however, these formations are important for local supplies and supplying base flow to rivers.

Much of the moderately permeable strata are overlain by superficial drift deposits. The deposits can vary in thickness and composition, from highly permeable outwash gravels to low permeability clays.

Weakly permeable formations are also present in the vicinity of the scheme. In the main these do not contain groundwater in exploitable quantities however, some formations can locally yield water supplies sufficient for private or domestic use.

Soils and Land Use

Soil type, characteristics and land use exert a considerable influence on the hydrological regime of any catchment. As illustrated on the Soils Survey of South East Scotland (Sheet 7) the proposed overhead line route is underlain by a mix of soil types including Organic Soils and soils of the Darvel, Glenalmond, Lanfine and Reppoch Associations.

Upland areas on either side of the Douglas Valley and around Coalburn are predominantly underlain by poorly draining, seasonally waterlogged soils including blanket peat, peaty gleys and non-calcareous gleys. The poorly draining nature of these soils restricts the uses to which the areas are put. Along the Glespin Burn and the Douglas Water the underlying soils comprise brown forest soils and alluvial soils which are relatively free draining. These soils tend to be more fertile.

The Land Use Capability for Agriculture map has been reviewed in order to determine the agricultural potential of the land. The areas crossed and adjacent to the proposed overhead line fall into one of two categories:

- Land suited only to improved grassland and rough grazings (Classes 5₂, 5₃ and 6₃); and
- Land capable of producing a narrow range of crops (Classes 4₁ and 4₂).

Land identified as capable of producing a narrow range of crops is confined to the lower sections of the Douglas Valley and the land adjacent to the Glespin Burn (illustrated in Figure 11.3 below). Arable farming is possible in these areas but yields are variable. During site surveys areas of grassland were observed, however, these were being used for grazing purposes.

Figure 11.3 Fertile soils around the Glespin Burn



Area adjacent to the Glespin Burn at Earl's Mill. Underlying soils are better drained and as a result more fertile, evidenced by agricultural activity on

At higher elevations, land is best suited to improved grassland and rough grazing. Soil, slope and wetness are factors which reduce the agricultural capability of these areas. Waterlogging was evident during site surveys in a number of areas including areas downslope of Hagshaw Hill (illustrated in Figure 11.4) and at Muirburn, north of Dalquhandy.

Figure 11.4 Soils on the upland area at Hagshaw Hill



Area adjacent to the dismantled railway downslope of Hagshaw Hill. Underlying soils tend to be seasonally waterlogged limiting potential use.

Ground Contamination

Adjacent to the route there are areas where former land uses could potentially have resulted in contamination, particularly Dalquhandy former opencast coal mine and the area adjacent to Coalburn bing.

11.4 Predicted Impacts

Construction

During the construction period compounds and lay-down areas for housing construction materials, plant, equipment and office accommodation for Contractors will be required at a small number of locations along the route. There is the potential for accidental spillage or release of construction materials directly into surface waters or field drains in the vicinity of construction activities. Potential contaminants may also become mobilised by surface runoff and eventually enter watercourses, drainage systems or groundwater and result in reductions in water quality.

Temporary access will be required at each section of the overhead line. Where possible access will be taken from existing tracks, however, in some locations new temporary access tracks may need to be put in place. Access tracks could impact on surface runoff patterns and promote erosion and localised flooding. No new watercourse crossings will be required to provide access.

Soil compaction could occur as a result of construction vehicles and plant passing over previously undeveloped land. This can cause a reduction in the volume of water permeating into the ground therefore increasing localised runoff. Runoff could contain suspended silt as the compacted ground would be susceptible to erosion, particularly if vegetation cover is reduced or absent. The areas at particular risk from compaction would be those at wood poles locations as these would be the focus of most activity. Felling of trees to clear wayleaves will also result in an increase in the amount of exposed land, increasing the potential for erosion.

Excavations associated with wood pole foundations would require earthworks in order to prepare foundations for the wood poles. Surface runoff may mobilise exposed sediment or construction materials and result in the pollution of waterbodies.

Sediment loading in surface waters could also cause blockages in culverted sections of watercourses or field or forestry drains, reducing the hydraulic capacity of the waterbodies and increasing the potential for flooding. In addition, damage to the banks and/or beds of watercourses may affect flow characteristics and could potentially result in secondary impacts on riparian and aquatic ecosystems.

Construction of wood pole foundations can alter groundwater flow and may necessitate dewatering, particularly at locations where a high water table is present. High sediment load in runoff may also arise where dewatering activities are required during excavations for wood pole structures. Water pumped from excavations is likely to contain a moderate level of suspended solids. If left to drain untreated, this runoff could discharge sediment loaded water to nearby field drainage systems. Earthworks associated with construction activities may mobilise pollutants in the soil and allow them to contaminate nearby watercourses through surface water run-off, infiltration to groundwater or via drains.

Peatlands, such as the raised bog at Coalburn Moss, have the potential to be detrimentally impacted upon during construction. The value of a raised peat bog depends on maintaining its water table and as such, any excavations adjacent to the bog could affect drainage rates and have a long term negative effect. However, due to the distance of the overhead line route from the bog and its modified nature pole placement or

undergrounding cabling are not considered likely to have any effect on the hydrology of Coalburn Moss.

Operation

Routine maintenance would occur during the operation of the proposed overhead line; however, the level of activity would be significantly reduced. During both regular and emergency maintenance potential pollutants including fuel and oil would be present on site. As a result there is the potential for the accidental release or spillage of potential contaminants.

The areas of exposed and bare ground will be significantly reduced during the operation of the proposed scheme. As a result the likelihood of erosion occurring is reduced. During maintenance vehicle or plant movements could result in some erosion, however, the extent of this is seasonally variable.

Overland surface flow patterns are unlikely to be significantly affected. The footprint of the wood pole structure is relatively small and consequently any modifications to surface runoff flows would be in the immediate locale of pole structures. Excavations for wood pole would be backfilled and compacted with excavated materials. The use of native materials and the relatively shallow depth of excavations are such that alterations to groundwater flow patterns would be minimal.

11.5 Mitigation

Construction

Mitigation measures have been identified and developed to address the potential effects on ground conditions and the water environment discussed above. These measures seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation. The appropriate consents under the Controlled Activities Regulations (CAR) would be obtained prior to construction. The specific CAR requirements would be identified with SEPA; however, at a minimum all construction activities would be expected to adhere to the General Binding Rules (GBRs).

In order to mitigate likely significant impacts during the construction phase, all works associated with the construction of the overhead line would be undertaken with due regard to the guidance contained within CIRIA Document C650 "Environmental Good Practice on Site", the "Forest and Water Guidelines" produced by the Forestry Commission and the following Pollution Prevention Guidelines (PPGs):

- PPG01 - General Guide to the Prevention of Pollution;
- PPG02 - Above Ground Oil Storage Tanks;
- PPG03 - Use and Design of Oil Separators in Surface Water Drainage Systems;
- PPG05 - Works and Maintenance in or Near Water;
- PPG06 - Working at Construction and Demolition Sites;
- PPG07 - Refuelling Facilities;
- PPG08 - Safe Storage and Disposal of Used Oils; and
- PPG21 - Pollution Incident Response Planning.

In addition to following all best practice guidance, an Environmental Management Plan (EMP) will be implemented by the Contractor to ensure adequate protection of the water environment. The terms of the construction contract will require the Contractor to deliver all mitigation measures contained within the ES.

A site induction will be undertaken in order to brief site workers of the requirements of the EMP and highlight the measures to be followed when working near watercourses. Training will be given in the emergency procedures, to be implemented in the event of a spillage or leakage of any polluting material such as fuel, oil or silt-laden drainage. Provision for containment and clean-up of the material will be made. The procedure will follow the recommendations in PPG21. Any oil or similar material will be cleaned away immediately using appropriate absorbent material to prevent it entering any local watercourse.

All construction traffic will use existing and temporary access tracks to minimise the potential for soil disturbance. Where required temporary tracks will be laid such that they minimise disturbance to existing surface runoff patterns. Where tracks are required to cross slopes, a drainage ditch will be cut on the upslope trackside with cross drains installed at regular intervals to allow drainage to flow to the downslope side.

Movement of construction vehicles and plant will be controlled in order to minimise the potential for soil compaction and erosion. Construction areas will be demarcated from sensitive sites so as to minimise the disturbance of land not required for development.

Where possible, soil excavation will be undertaken during drier periods so as to reduce the potential for mobilisation of exposed soil and/or sediment. No excavations will be undertaken during prolonged periods of heavy rainfall. Excavated soils will be stored in bunded areas away from surface waters in order to ensure sediments are not mobilised during rainfall events and washed into watercourses or drains. Top soil at each wood pole structure location will be stripped and stored for use in reinstatement.

Earthworks will be undertaken in accordance with BS6031:1981 "Code of Practice for Earth Works". Land disturbance would be kept to a minimum and disturbed areas would be restored as soon as possible after construction.

During the excavation of wood poles, foundations or cable trenches temporary drainage infrastructure will be installed as required to attenuate, treat and where appropriate discharge any water pumped from the excavations and any surface water runoff.

In order to prevent pollutants leaking from static plant, such as pumps and generators, contaminating the ground and being washed into surface watercourses, static plant will be placed on drip trays wherever practicable.

Chemicals, fuels and oils will be stored in secure and designated storage areas and in accordance with the appropriate regulatory requirements, including COSHH Regulations 1994. Storage areas will all be located on hardstanding areas so as to prevent the possible infiltration of contaminants into the soil. Stockpiles of dry materials will be stored in locations that prevent contamination of surface waters and materials will not be stockpiled without appropriate safety and mitigation systems in place.

The stockpiling of materials on floodplains or adjacent to watercourses will be avoided where possible. In order to minimise the potential for contaminants to enter watercourses in close proximity to constructions sites temporary bunding and SUDS will be put in place to intercept and treat any potentially polluted runoff where necessary.

Operation

When developing the proposed overhead line route a key design consideration has been the proximity of wood pole structures to surface

waterbodies. Wherever possible the structures have been located at least 15m away from surface watercourses such that they would have a negligible impact on water quality or the physical characteristics of watercourses.

Post-construction, all affected land would be restored in order to ensure that any effects on overland drainage flows and surface runoff patterns are minimised.

Where maintenance activities are to be undertaken mitigation measures similar to those put in place during construction would be required. This would include adherence to relevant SEPA Pollution Prevention Guidelines, the use of drip trays under static plant, use of existing access arrangements and control of all vehicle movements.

11.6 Residual Impacts

Construction

Residual effects are described in Table 11.5 below. No significant residual effects are predicted assuming appropriate mitigation measures are put in place.

Table 11.5 Residual Impacts Construction

Impact Type		Impact Significance
Pollution incident	Existing water quality along the majority of the proposed overhead line is considered to be of medium to high sensitivity as it is generally rated as good. With mitigation in place the likelihood of a pollution incident can be managed and controlled such that it is unlikely to occur. In the event that there is a leak or spillage of contaminants emergency procedures are in place to ensure	Minor Adverse
Soil compaction and erosion	The majority of soils along the proposed overhead line are considered to be of low sensitivity; however, where more fertile soils are present sensitivity is moderate. Mitigation during construction will focus on reducing the magnitude of the effect through reducing the total area affected. Earthworks for the erection of wood poles are temporary and stripped top soils will be used to restore the immediate locale around wood poles.	None

Impact Type		Impact Significance
Sedimentation of surface watercourses	Eroded soils can become entrained within surface runoff and consequently represent a pollution risk. Stripped and stockpiled soils and topsoils will be stored in bunded areas away from watercourses. The temporary nature of construction means that soils will be exposed for short periods only.	Minor Adverse
Modifications to surface runoff patterns and drainage	Local surface runoff drains to the Douglas Water either directly or via its tributaries. Any modifications to surface runoff patterns will be highly localised and are unlikely to have a significant effect on the overall catchment hydrology. The appropriate drainage consents will be acquired prior to construction. All drainage will be collected, attenuated and treated, then discharged appropriately.	None
Modifications to groundwater levels and flow patterns	Excavations could disrupt shallow groundwater deposits and require dewatering. Such impacts would be highly localised and short term.	Minor Adverse

Operation

Permanent residual effects are described in Table 11.6. No significant residual effects are predicted assuming appropriate mitigation measures are put in place.

Table 11.6 Residual Impacts Permanent

Impact Type		Impact Significance
Pollution Incident	Periodic and intermittent maintenance and repair may be required during which time pollutants may be present on site. A pollution incident is considered unlikely during maintenance activities nevertheless such activities shall undertaken in accordance with SEPA PPGs and other appropriate guidance.	None

Impact Type		Impact Significance
Modifications to surface runoff patterns	The footprint of the proposed overhead line is minimal and any affected areas will be restored following construction such that the surface runoff patterns are similar to those pre-construction. It will not significantly increase flood risk.	None
Modifications to groundwater flows and levels	Groundwater flows and levels will not be significantly affected by the operation of the proposed overhead line.	None

11.7 Summary

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 to establish areas containing economically important coal deposits in order that they be 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 restored. There will be a permanent loss of a small amount of soils but overall impacts on ground conditions are considered to be **Not Significant**.

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 pole structures will be located such 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 scheme relate to modifications of surface water runoff patterns and flood risk. Due to the minimal foot print of the wood pole structures, the changes to surface runoff are **Not Significant**.

12. Summary of Assessment & Mitigation

12.1 Summary of EIA Results

In accordance with their duties as the Transmission Licence holder, Scottish Power Transmission (SPT) has developed an overhead line that, on balance, results in a minimal environmental impact but which is also technically and economically feasible. A detailed summary of the EIA results is contained within this chapter in the Table 12.1.

Generally the proposed overhead line is considered to result in a minimal impact. Sensitive routing and design as well as careful and considerate construction mean that the majority of environmental impacts have been successfully avoided or mitigated and consequently any resulting impacts 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.

12.2 SPT's Statutory Duties

As stated in Chapter 1 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.

Table 12.1 Summary of Assessment

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.3 LAND USE, ACCESS & RECREATION									
Land take required for temporary storage areas, compounds and workers' facilities during construction.	Negative	Temporary	Likely	Low	Existing land use.	Low	Temporary storage compounds and facilities will be located on areas that cause least disturbance to existing land use(s). Locations of such areas will be agreed in advance with the Contractor and affected land owners.	Minor Adverse	Not Significant
Land take to facilitate excavation, wood pole erection and conductor stringing.	Negative	Temporary	Likely	Low	Existing land uses. Sensitivity varies according to land use with improved grassland and agricultural land the most sensitive.	Low to Medium	Working areas at pole locations will be kept to a minimum to ensure disruption to existing land uses are kept to a minimum.	Minor Adverse	Not Significant
Disturbance to existing land uses during the construction period.	Negative	Temporary	Likely	Low	Existing land use.	Low to Medium	Working areas at pole locations will be kept to a minimum. Following completion of construction activities all land temporarily affected will be restored.	Minor Adverse	Not Significant
Land take required to provide temporary access to construction areas.	Negative	Temporary	Possible	Low	Existing land uses. Sensitivity varies according to land use with improved grassland and agricultural land the most sensitive.	Low to Medium	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 temporary access is required to be provided it will be agreed with the Contractor and affected land owners.	Minor Adverse	Not Significant
Intermittent severance of Rights of Way, public paths and tracks during the construction period.	Negative	Temporary	Likely	Low	Access along sections of rights of Way and other public paths and tracks.	Medium	All temporary closures of Rights of Way and other such public paths will be clearly communicated to the public in advance. This will include, where appropriate, the use of signage. Temporary diversions will be put in place to ensure severance and disturbance are minimised.	Minor Adverse	Not Significant
Removal of woodland including felling and lopping of trees to provide the necessary wayleaves.	Negative	Temporary	Likely	Low	Commercial woodland at Andershaw and south of Dalquhandy where existing wayleaves are to be widened. Recently planted woodland at Earl's Mill and south of Dalquhandy where wayleaves are to be felled.	Low	Where trees are to be felled or lopped or 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 land reinstatement process.	Minor Adverse	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.3 LAND USE, ACCESS & RECREATION (continued)									
Permanent land take associated with wood poles.	Negative	Permanent	Likely	Negligible	Existing land uses. Sensitivity varies according to land use with improved grassland and agricultural land the most sensitive.	Low to Medium	Through the routeing and line design process impacts on the most sensitive land uses have been minimised. The footprint of the wood poles structures is minimal.	None	Not Significant
Increased risk of windthrow within felled areas of woodland.	Negative	Permanent	Possible	Low	Commercial woodland at Andershaw and south of Dalquhandy where existing wayleaves are to be widened. Recently planted woodland at Earl's Mill and south of Dalquhandy where wayleaves are to be felled.	Low	Prior to construction an assessment will be made of the risk of windthrow from proposed felling. Where appropriate, management measures will be proposed for any affected sections of plantation; including 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.	Minor Adverse	Not Significant
Permanent loss of woodland to provide the necessary wayleaves.	Negative	Permanent	Likely	Low	Commercial woodland at Andershaw and south of Dalquhandy where existing wayleaves are to be widened. Recently planted woodland at Earl's Mill and south of Dalquhandy where wayleaves are to be felled.	Low	Areas of woodland to be felled have been kept to a minimum through the design of the overhead line. Where possible existing wayleaves and rides have been used. The precise areas of woodland to be removed will be established prior to construction.	Minor Adverse	Not Significant
Maintenance of wayleaves through woodland by lopping.	Negative	Permanent	Possible	Low	Commercial woodland at Andershaw and south of Dalquhandy where existing wayleaves are to be widened. Recently planted woodland at Earl's Mill and south of Dalquhandy where wayleaves are to be felled.	Low	Where wayleaves require to be maintained by felling or lopping during the lifetime of the overhead line such activities will be undertaken by a suitably qualified arborist.	Minor Adverse	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.4 LANDSCAPE & VISUAL AMENITY									
Impacts on Landscape Designations.	Negative	Permanent	Likely	Negligible	Southern Uplands Regional Scenic Area (RSA)	Medium	The principal form of mitigation of impacts on landscape resources has been through the overhead line routeing and design process. As much as possible the route has sought to avoid particularly sensitive landscapes, however, it is recognised that impacts on landscape are unavoidable with development of this type. In order to reduce the significance of impacts through the design of the overhead line route, landform and vegetation have been used to provide a backdrop to scheme, screen it and reduce the number of locations where it will break the skyline. In addition the selection of a double wood pole model as opposed to traditional steel lattice towers will further reduce the landscape impacts. Wood poles are more slender and subtle in appearance and considered more suitable for the rural and treed landscape of the Douglas Valley. Micrositing wood pole structures prior to construction activities may further reduce impacts.	None	Not Significant
	Negative	Permanent	Likely	Low to Medium	Douglas Valley Area of Great Landscape Value (AGLV)	High		Minor, and Moderate (in a limited area)	Significant (in a limited area)
Impacts on Regional Landscape Character Types (LCTs).	Negative	Permanent	Likely	Negligible	Foothills	High	In order to reduce the significance of impacts through the design of the overhead line route, landform and vegetation have been used to provide a backdrop to scheme, screen it and reduce the number of locations where it will break the skyline. In addition the selection of a double wood pole model as opposed to traditional steel lattice towers will further reduce the landscape impacts. Wood poles are more slender and subtle in appearance and considered more suitable for the rural and treed landscape of the Douglas Valley. Micrositing wood pole structures prior to construction activities may further reduce impacts.	None	Not Significant
	Negative	Permanent	Likely	Negligible	Broad Valley Upland	Medium to High		None	Not Significant
	Negative	Permanent	Likely	Low	Plateau Farmland	Medium		Minor	Not Significant
	Negative	Permanent	Likely	Low to Medium	Upland River Valleys	High		Minor, and Moderate (in a limited area)	Significant (in a limited area)
	Negative	Permanent	Likely	Negligible to Low	Plateau Moorlands	Medium to High		Minor	Not Significant
Impacts on Local Landscape Character Areas (LLCAs)	Negative	Permanent	Likely	Low	Upland Moorland with Commercial Forestry	Low	Whilst every effort has been made to avoid impacting on the Douglas AGLV the location of it with respect to the proposed windfarm at Andershaw and Coalburn substation is such that it cannot be avoided without making a significant diversion. Routeing to the west would increase the potential to impact on the Muirkirk and North Lowther Special Protection Area whilst routeing to the east would result in impacts on population centres at Rigside.	None	Not Significant
	Negative	Permanent	Likely	Low	Upland Moorland	High		Minor	Not Significant
	Negative	Permanent	Likely	None	Opencast Mining	Low		None	Not Significant
	Negative	Permanent	Likely	Negligible to Low	Restored Opencast Mining	Low to Medium		Minor	Not Significant
	Negative	Permanent	Likely	Medium	River Valley Pasture	High		Moderate	Significant
	Negative	Permanent	Likely	Negligible	Upland Moorland with Windfarm	Low to Medium		None	Not Significant
	Negative	Permanent	Likely	Medium	Lowland Moorland	Low		Minor	Not Significant
	Negative	Permanent	Likely	Medium	Undulating Pasture	Medium		Moderate	Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.4 LANDSCAPE & VISUAL AMENITY (continued)									
Visual impact from selected representative viewpoints.	Negative	Permanent	Likely	Low	VP 1 Auchensaugh Hill	High	<p>The principal form of mitigation of impacts on visual resources has been through the overhead line routeing and design process.</p> <p>As much as possible the route has sought to avoid impacting on potential visual receptors. Generally it avoids large concentrations or clusters of properties however, it is routed in in the vicinity of scattered individual properties.</p> <p>In order to reduce the significance of impacts through the design of the overhead line route, landform and vegetation have been used to provide a backdrop to scheme, screen it and reduce the number of locations where it will break the skyline.</p> <p>In addition the selection of a double wood pole model as opposed to traditional steel pylons will further reduce the landscape impacts. Wood poles are more slender and subtle in appearance and considered more suitable for the rural and treed landscape of the Douglas Valley.</p> <p>Micrositing wood pole structures prior to construction activities may further reduce impacts.</p>	Minor	Not Significant
	Negative	Permanent	Likely	Medium (Residential)	VP 2 Earl's Mill at Glespin Burn	High (Residential)		Moderate (Residential)	Significant (Residential)
	Negative	Permanent	Likely	Low (Road Users)		Low to Medium (Road Users)		Minor (Road Users)	Not Significant (Road Users)
	Negative	Permanent	Likely	Medium	VP 3 Jeanfield Bridge on the A70	Low to Medium		Minor	Not Significant
	Negative	Permanent	Likely	Medium	VP 4 A70 adjacent to Hazelside Farm	High (Residential)		Moderate (Residential)	Significant (Residential)
	Negative	Permanent	Likely	Medium		Low to Medium (Road Users)		Minor (Road Users)	Not Significant (Road Users)
	Negative	Permanent	Likely	Medium	VP 5 Dismantled railway at Hagshaw Hill Windfarm	High		Minor	Not Significant
	Negative	Permanent	Likely	Low	VP 6 Outdoor Centre at Douglas West	High		Minor	Not Significant
	Negative	Permanent	Likely	Low	VP 7 Footpath on the north west of Coalburn	High		Minor	Not Significant
	Negative	Permanent	Likely	Medium	VP 8 North of Coalburn near Muirburn	High		Moderate (Residential)	Significant (Residential)
	Negative	Permanent	Likely	Medium	VP 9 Access track south of Glaikhead	Medium to Low		Minor	Not Significant
	Negative	Permanent	Likely	Low	VP 10 Glaikhead adjacent to Coalburn Road	High (Residential)		Minor (Residential)	Not Significant (Residential)
	Negative	Permanent	Likely	Low		Medium (Road Users)		Minor (Road Users)	Not Significant (Road Users)
Negative	Permanent	Likely	Medium	VP 11 Johnshill adjacent to Coalburn Road	Medium to Low	Minor	Not Significant		

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude*	Receptor	Receptor Sensitivity	Mitigation	Residual Effect* (with mitigation)	Significance of Residual Effect
12.5 ECOLOGY & NATURE CONSERVATION									
Impacts on designated sites.	Negative	Temporary	Unlikely	-	Coalburn Moss SAC & SSSI	Very High	Route selection during overhead line design ensured all designated areas would be avoided with no direct or indirect impacts on the qualifying features.	-	Not Significant
	Negative	Temporary	Unlikely	-	Millers Wood SSSI	High		-	Not Significant
	Negative	Temporary	Unlikely	-	Windrow Wood AWI	Medium		-	Not Significant
Loss of small areas of habitats or notable flora of ecological interest in a local context.	Negative	Temporary	Unlikely	-	Bryophyte springs and flushes	Low-Medium	Micrositing of poles during construction with supervision from a suitably qualified ecologist. An ecologist will also be present during construction to advise on the removal and reinstatement of top soil and vegetation.	-	Not Significant
	Negative	Temporary	Likely	-	Steep valley at NW corner of Windrow Wood	Low-Medium		-	Not Significant
	Negative	Temporary	Likely	-	Sloped wood pasture to the west of Millers Wood	Medium		-	Not Significant
	Negative	Temporary	Likely	-	Derelict ground to the west of the ping at Glaikhead.	Low-Medium		-	Not Significant
Disturbance of flora and fauna resulting from construction activities (such as dust, noise & movement of machinery and human activity)	Negative	Temporary	Likely	-	All flora within and in the vicinity of the construction corridor.	Low-Medium	Dust, noise and other effects resulting from construction activities will be suitably managed and appropriate guidance followed. Protocol, such as damping down to reduce dust levels, will be included within the method statement. Pre-construction ecological surveys targeted within 100m of the proposed overhead line will be undertaken. Working hours will be limited to one hour after dawn until one hour before dusk. Pre-construction ecological surveys targeted within 100m of the proposed overhead line will be undertaken. Pre-construction ecological surveys targeted within 100m of the proposed overhead line would be undertaken. Pre-construction ecological surveys targeted within 100m of the proposed overhead line will be undertaken.	-	Not Significant
	Negative	Temporary	Likely	-	Otters	Low-Medium		-	Not Significant
	Negative	Temporary	Possible	-	Water voles	Low-Medium		-	Not Significant
	Negative	Temporary	Possible	-	Badgers	Low		-	Not Significant
	Negative	Temporary	Possible	-	Bats	Low		-	Not Significant

* Latest guidance (IEEM 2006) advocates less emphasis on matrix systems for evaluating impacts on features of ecological interest and importance and as such impacts have been assessed as being significant, not significant or neutral.

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude*	Receptor	Receptor Sensitivity	Mitigation	Residual Effect* (with mitigation)	Significance of Residual Effect
12.5 ECOLOGY & NATURE CONSERVATION (continued)									
Disturbance and/or pollution of surface water resulting from construction activities near watercourses.	Negative	Temporary	Unlikely	-	All watercourses, water bodies and wetlands within and in the vicinity of the construction corridor.	Low-Very High	Wood pole structures will not be situated immediately adjacent to any waterbody and crossing of watercourses will aim for minimal riparian impact. In addition, works will be carried out following guidance such as SEPA's PPGs.	-	Not Significant
Loss of otter holts, couches or other resting sites	Negative	Permanent	Unlikely	-	Otters	Low-Medium	Pre-construction ecological surveys targeted within 100m of the proposed overhead line will be undertaken.	-	Not Significant
Loss of water vole burrows/habitat	Negative	Permanent	Unlikely	-	Water voles	Low-Medium	Pre-construction ecological surveys targeted within 100m of the proposed overhead line will be undertaken.	-	Not Significant
Loss of badger setts	Negative	Permanent	Unlikely	-	Badgers	Low	Pre-construction ecological surveys targeted within 100m of the proposed overhead line will be undertaken	-	Not Significant
Loss of badger foraging habitat	Negative	Temporary	Likely	-	Badgers	Low	No barriers will be used on site to identify working areas and no excavations will be left open overnight.	-	Not Significant
Loss of bat roost through tree removal.	Negative	Permanent	Unlikely	-	Bats	Low	Pre-construction bat surveys of any broad-leaved trees identified as having bat roosting potential requiring felling will be carried out.	-	Not Significant
Loss of bat commuting corridors	Negative	Permanent	Unlikely	-	Bats	Low	All tree felling is to be carried out along existing rides and breaks in the forestry plantations, therefore not affecting any commuting corridors that may be in use by bats in the area.	-	Not Significant
Entrapment of mammals	Negative	Temporary	Unlikely	-	All mammals	Low-Medium	No excavations will be left open overnight.	-	Not Significant
Maintenance of the overhead line route including tree lopping and felling	Negative	Temporary	Likely	-	Flora along the overhead line route	Low-Medium	Tree lopping will be kept to a minimum therefore limiting the impact on flora along the overhead line corridor.	-	Not Significant

* Latest guidance (IEEM 2006) advocates less emphasis on matrix systems for evaluating impacts on features of ecological interest and importance and as such impacts have been assessed as being significant, not significant or neutral.

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.6 ORNITHOLOGY									
Disturbance during construction period.	Negative	Temporary	Likely	Minor	Breeding birds	Low to High	Construction will comply with the Wildlife and Countryside Act 1981 (as amended). Pre-construction surveys will be undertaken to identify the any breeding birds nesting or present within or close to working areas. Construction works would be programmed to avoid disturbance during periods or in areas identified as being particularly sensitive following pre-construction surveys.	Minor Adverse	Not Significant
	Negative	Temporary	Likely	Minor	Wintering birds	Low to High	Where possible tree felling or vegetation clearance required to facilitate construction and operation of the grid connection will be undertaken outwith the breeding season. Where tree felling or vegetation clearance is required during the breeding season it will only be undertaken following a detailed breeding bird survey by a suitably qualified ecologist. Construction activities will be undertaken within defined areas to limit disturbance and will occur within set working hours so as to not impact on birds at dawn or dusk. Advice on appropriate working methods and standoff distances from sensitive areas, such as nesting sites of would be provided by a suitably qualified ecologist.	Minor Adverse	Not Significant
Habitat loss and displacement of species during construction period.	Negative	Temporary	Likely	Neutral	Breeding birds	Low to High	Should any active Schedule 1 species nest sites be identified during construction all works will be suspended within that area and advice sought from a suitably qualified ecologist on the most appropriate course of action.	Minor Adverse	Not Significant
	Negative	Temporary	Likely	Minor	Wintering birds	Low to High	Where construction works have the potential to affect active nest sites a suitably qualified ecologist will supervise construction works.	Minor Adverse	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.6 ORNITHOLOGY (continued)									
Permanent loss of, or reduction in value of habitat and displacement of species.	Negative	Permanent	Possible	Negligible	Breeding birds	Low to High	Permanent land take of the wood pole structures is minimal. In designing the route of the overhead line sensitive areas have been avoided as much as possible.	Minor Adverse	Not Significant
	Negative	Permanent	Possible	Neutral to Minor	Wintering birds	Low to High	Micrositing of wood pole structures would be undertaken where appropriate in order to avoid any areas identified as being sensitive following a pre-construction walkover survey.	Minor Adverse	Not Significant
Increased collision risk and potential bird fatalities.	Negative	Permanent	Possible	Negligible	Breeding birds	Low to High	Overall the risk of collision is considered to be low, however, it does vary according to species of bird. The design of the wood pole structures is such that the number of vertical wires are minimised. Conductors are horizontal and as a result reduce the risk of collision.	Minor Adverse	Not Significant
	Negative	Permanent	Possible	Minor	Wintering birds	Low to High	Where required cable stays will be brightly coloured such that they are highly visible. Bird deflectors are not proposed. Should pre-construction surveys indicate the risk of collision has increased from that identified during baseline surveys bird deflectors will be used as required.	Minor Adverse	Not Significant
Disturbance during maintenance activities for example maintaining wayleaves.	Negative	Permanent	Possible	Minor	Species	Low to High	Where possible regular maintenance will be timed such that it occurs outwith the breeding period. Where emergency maintenance is required this may not be possible. Where appropriate maintenance activities will be undertaken following a breeding bird survey by a suitably qualified ecologist.	Minor Adverse	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.7 CULTURAL HERITAGE & ARCHAEOLOGY									
Direct physical impacts on known archaeological features resulting from construction activities.	Negative	Permanent	Likely	Minor to Major	Known archaeological features within the vicinity of the overhead line.	Negligible	Wood pole structures will be microsituated where appropriate to avoid directly impacting on archaeological sites or features. Where archaeological sites or features are affected by construction activities, an archaeological watching brief will be maintained during topsoil removal, earthworks and wood pole structure erection. Should earthworks for wood pole structures or cable trenches yield previously unknown archaeological remains construction works would be halted. A suitably qualified archaeologist would be contacted, the remains inspected and appropriate method of preservation or removal identified.	Minor Adverse	Not Significant
Direct physical impacts on unknown archaeological features resulting from construction activities.	Negative	Permanent	Possible	Minor to Major	Unknown archaeological features within the vicinity of the overhead line.	Unknown	The requirement to undertake archaeological investigation of sites impacted on by the proposed overhead line would be confirmed in consultation with the West of Scotland Archaeological Society (WoSAS).	Minor Adverse	Not Significant
Indirect physical impacts including the destabilisation of the preserving environment for nearby archaeological sites, severance of historic land parcels, disturbance to historic land use, and prevention of access leading to a reduced ability to manage a site or a reduction in its amenity value.	Negative	Permanent	Likely	Minor to Major	Known archaeological features within the vicinity of the overhead line.			Minor Adverse	Not Significant
Indirect visual impacts on the setting of sites and monuments.	Negative	Permanent	Unlikely	Intermediate	Scheduled Monument, listed buildings, Registered Gardens and Designed Landscapes and Conservation Areas.	High to Low	The locations of Scheduled Monuments, listed buildings and Conservation Areas was a key consideration in developing the route of the proposed scheme. These have been avoided by the route	None	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.8 GROUND CONDITIONS & THE WATER ENVIRONMENT									
Accidental spillage, leakage or other release of potential contaminants such as fuels, oils, stockpiled soils or static plant into surface water or field drains.	Negative	Temporary	Possible	Low to Medium	Water quality within surface waters or field drains in the vicinity of site compounds and construction areas.	Medium to High	<p>An Environmental Management Plan (EMP) will set out all mitigation measures to be implemented during the project.</p> <p>A site induction will be undertaken in order to brief site workers of the requirements of the EMP and highlight the measures to be followed when working near watercourses.</p> <p>Training will be given in the emergency procedures, to be implemented in the event of a spillage or leakage of any polluting material such as fuel, oil or silt-laden drainage. Provision for containment and clean-up of the material will be made. The procedure will follow the recommendations in PPG21.</p> <p>Any oil or similar material will be cleaned away immediately using appropriate absorbent material to prevent it entering any local watercourse. Oil spill kits will be provided and training on their use given to all site personnel.</p> <p>Minimal amounts of fuels, oils etc will be stored in site compounds. These will be stored in secure and designated storage areas and in accordance with the appropriate regulatory requirements, including COSHH Regulations 1994. Storage areas will all be located on hardstanding areas so as to prevent the possible infiltration of contaminants into the soil. Stockpiled soils will be stored in safe bunded areas to prevent mobilisation.</p>	Minor Adverse	Not Significant
Foul drainage generated by site office facilities.	Negative	Temporary	Likely	Low to Medium	Water quality within surface waters or field drains in the vicinity of site compounds.	Medium to High	Foul drainage generated by toilet facilities at the site compound will be discharged to a tank and taken off site for disposal via an appropriate method.	Minor Adverse	Not Significant
Leakage of contaminants from static plant and vehicles.	Negative	Temporary	Possible	Low to Medium	Water quality within surface waters or field drains in the vicinity of site compounds and construction areas.	Medium to High	In order to prevent materials leaking from static plant, such as pumps and generators, contaminating the ground and being washed into the drainage system, static plant would be placed on drip trays wherever practicable.	Minor Adverse	Not Significant
Silt laden water resulting from washing of vehicles and plant.	Negative	Temporary	Possible	Low to Medium	Water quality within surface waters or field drains in the vicinity of site compounds and construction areas.	Medium to High	Facilities for washing plant and equipment contaminated with mud would be provided. Wash water from the facilities would be managed so as to prevent pollution of surface water and groundwater.	Minor Adverse	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.8 GROUND CONDITIONS & THE WATER ENVIRONMENT (continued)									
Contaminated runoff and drainage from site compounds or construction areas.	Negative	Temporary	Likely	Low to Medium	Water quality within surface waters or field drains in the vicinity of site compounds and construction areas.	Medium to High	<p>Temporary site compounds and construction areas will be located as far away from surface watercourses as is practical.</p> <p>All construction activities will be undertaken in accordance with SEPA Pollution Prevention Guidelines.</p> <p>During preparation works temporary drainage to ensure controlled management of runoff draining from the construction site will be prepared. This will be based on the guidance contained within CIRIA Document C521 "Sustainable Urban Drainage Systems – Design Manual for Scotland and Northern Ireland".</p> <p>Runoff from the site will not be allowed to drain directly into any watercourse and would be filtered and attenuated using silt traps, filter strips, cut-off drains and settlement ponds as appropriate.</p>	Minor Adverse	Not Significant
Mobilisation of exposed/stockpiled sediments or soils by surface water runoff resulting in reductions in surface water quality.	Negative	Temporary	Possible	Low to Medium	Water quality within surface waters or field drains in the vicinity of site compounds and construction areas.	Medium to High	<p>Soil excavation will be undertaken during drier periods so as to reduce the potential for mobilisation of exposed soil and/or sediment and that stripped top soils and excavations would be exposed, particularly during wetter periods.</p> <p>Excavated soils and stored top soils will be stored in bunded areas. Stockpiling of materials on floodplains or adjacent to watercourses will be avoided where possible.</p>	Minor Adverse	Not Significant
Modifications to surface runoff from construction areas and temporary access tracks.	Negative	Temporary	Likely	Low to Medium	Catchment hydrology	Negligible	<p>Wherever possible access will be taken from existing roads and tracks.</p> <p>Any temporary access provisions will be aligned such that they minimise disturbance to existing surface runoff patterns.</p>	None	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.8 GROUND CONDITIONS & THE WATER ENVIRONMENT (continued)									
Soil compaction and increased rates of erosion resulting from construction vehicles and plant passing over undeveloped land.	Negative	Temporary	Likely	Low	Soils	Low	<p>Movement of construction vehicles and plant will be controlled in order to minimise the potential for soil compaction and erosion.</p> <p>Sensitive sites will be demarcated from construction areas so as to minimise the disturbance of land not required for development.</p> <p>Scheduling construction activities in order to minimise the area and period of time that soil would be exposed, particularly during wetter periods. During prolonged periods of heavy rainfall no soil stripping or earthworks would occur.</p> <p>Construction areas would be kept to a minimum so as to reduce the disturbance of land not required for the development.</p>	None	Not Significant
Increased runoff rates and volumes resulting from compacted soils and associated increased potential for flooding.	Negative	Temporary	Likely	Low	Water quality within surface waters or field drains in the vicinity of site compounds and construction areas.	Medium to High	<p>Runoff from the site will not be allowed to drain directly into any watercourse and temporary SUDS would be used to ensure that runoff is filtered and attenuated reducing the risk of flooding in adjacent watercourses.</p> <p>Surface waters including field drains in the vicinity of construction activities will be regularly inspected to ensure that there are no blockages such as sediments that may impede flow and result in flooding.</p>	None	Not Significant
Disturbance to stream morphology during construction and secondary impacts on riparian or aquatic ecosystems.	Negative	Temporary	Possible	Low	Surface waters or field drains and riparian or aquatic habitats or species in the vicinity of site compounds and construction areas.	Medium to High	<p>In identifying the route of the overhead line watercourse spans have been minimised as much as possible.</p> <p>Construction areas will be located as far away from surface watercourses as is practical.</p>	Minor Adverse	Not Significant
Damage to soil profile and land use capability.	Negative	Temporary	Likely	Low	Soils	Low to Medium	<p>Soils will be appropriately stored and used to backfill trenches.</p> <p>All land temporarily affected by construction will be restored following construction.</p>	None	Not Significant
Cable trenches acting as a conduit for surface water runoff.	Negative	Temporary	Likely	Low	Catchment hydrology		<p>Trenches will be backfilled as soon as is practicable in order to prevent them acting as conduits for surface runoff.</p>	None	Not Significant

Description of Potential Effect					Description of Receptor		Description of Residual Effect		
Effect	Nature of Effect	Duration	Likelihood	Effect Magnitude	Receptor	Receptor Sensitivity	Mitigation	Residual Effect (with mitigation)	Significance of Residual Effect
12.8 GROUND CONDITIONS & THE WATER ENVIRONMENT (continued)									
Excavations for wood poles or cable trenches could alter groundwater flow and should groundwater ingress occur dewatering may be required. Water pumped from excavations is likely to contain a moderate level of suspended solids.	Negative	Temporary	Likely	Medium	Groundwater flow regime and quality.	Medium to High	Water pumped from excavations would be directed to a settlement pond or tank to allow for removal of suspended solids prior to discharge.	Minor Adverse	Not Significant
Waste generated during construction activities including surplus materials and excavated soils.	Negative	Temporary	Likely	Low	Soils	Low	Waste materials would be removed from site and disposed of in an appropriate manner. Following construction all areas will be inspected to ensure removal of waste and surplus materials. Surplus soils would be used in the reinstatement of affected land and spread around the construction areas.	None	Not Significant
Modification of surface runoff patterns resulting from land take of the wood pole structures.	Negative	Permanent	Likely	Low	Catchment hydrology	Negligible	The overall footprint of the wood poles structures is minimal. All land temporarily affected would be restored following construction.	None	Not Significant
Accidental spillage or release of contaminants during periodic or routine maintenance.	Negative	Permanent	Possible	Low	Water quality within surface waters or field drains in the vicinity of site compounds and construction areas.	Medium to High	The mitigation identified within the EMP would apply during maintenance activities.	None	Not Significant
Modifications to groundwater flow and quality.	Negative	Permanent	Likely	Medium	Groundwater flow and quality	Medium to High	Groundwater flows and levels will not be significantly affected by the operation of the proposed overhead line.	None	Not Significant

13. Schedule of Mitigation Measures

DESCRIPTION OF MITIGATION MEASURES		Mitigation Principle (Avoid / Reduce / Offset)
13.1 STAGE: OVERHEAD LINE DESIGN		
Identification of the Proposed Overhead Line Route	<ul style="list-style-type: none"> Mitigation has been an inherent part in the identification of route options and the development of the proposed grid connection. The routing process has been the most basic and effective form of mitigation. By considering potential environmental impacts throughout the development of the route it has been possible to avoid particular areas and thus ensure impacts do not result. This is particularly true of impacts on designated sites and landscape and visual impacts. As the scheme has been progressed it has been developed such that it avoids designated sites, sensitive landscapes and existing overhead line infrastructure as much as possible and makes best use of landform, topography and vegetation to backcloth the grid connection and prevent it from breaking the skyline. 	Avoid / Reduce
Wood Pole Design	<ul style="list-style-type: none"> Traditionally 132kV overhead lines have been carried by larger steel lattice towers, however, the overhead section of proposed grid connection is to be carried by a double wood pole structure. The development of the double wood pole structure has been a result of the number of 132kV grid connections SPT are obliged to provide. The proposed double wood pole provides the required rigidity to withstand the effects of wind and ice loading but is more slender in appearance and can be more sensitively routed through rural landscapes such as that of the Douglas Valley. The design of the of the wood pole structures is such that the number of vertical wires are minimised. Conductors are horizontal and thicker than conductors on traditional wood pole models and as such should be slightly more visible to birds. Where required cable stays will be brightly coloured such that they are highly visible. 	Reduce
13.2 STAGE: PRE-CONSTRUCTION		
Identification of and agreement with landowners of the locations and routes of storage areas and access requirements	<ul style="list-style-type: none"> Temporary storage compounds, facilities, working areas and access requirements including the provision of temporary access tracks will be located on areas that cause the least disturbance to existing land use(s). The precise locations of all temporary storage compounds, facilities, working areas and temporary access tracks as well as access requirements from existing tracks will be identified by the Contractor and agreed with affected land owners in advance of construction. Temporary site compounds and construction areas will be located as far away from surface watercourses as is practical. No temporary or permanent watercourse crossings will be required. 	Avoid / Reduce
Protected Species Surveys	<ul style="list-style-type: none"> Pre-construction ecological surveys targeted within 100m of the proposed overhead line will be undertaken by a suitably qualified ecologist. Target species will include badgers, bats, and in the vicinity of spanned watercourses otters and water voles. 	Avoid / Reduce
Breeding Bird Surveys	<ul style="list-style-type: none"> Pre-construction surveys will be undertaken to identify any breeding birds, particularly Schedule 1 species, nesting or present within or close to working areas. 	Avoid / Reduce
Preparation of an Environmental Management Plan (EMP)	<ul style="list-style-type: none"> An Environmental Management Plan (EMP) will be prepared by SP Transmission. This will be based on the mitigation contained within the Environmental Statement and supplemented as appropriate should further mitigation be identified during the course of pre-construction surveys. The EMP will take account of the guidance contained with CIRIA Documents C650 "Environmental Good Practice on Site" and C532 "Control of Water Pollution" 	Avoid / Reduce
Preparation of a Construction Method Statements	<ul style="list-style-type: none"> Construction Method Statements, in accordance with best practice, will detail the construction activities to be undertaken will be prepared by the Contractor prior to the commencement of construction activities. These will be made available to SEPA for review. The Construction Method Statements will include a description of construction activities including excavations, top soil stripping, storage of soil and peat and reinstatement of affected land. 	Reduce
Construction Staff Training	<ul style="list-style-type: none"> A site induction will be undertaken in order to brief site workers of the requirements of the EMP and highlight the sensitive areas along the and adjacent to the proposed overhead line route including areas where protected species are potentially present. Training will be given in the emergency procedures, to be implemented in the event of a spillage or leakage of any polluting material such as fuel, oil or silt-laden drainage. 	Avoid / Reduce
Construction Programming	<ul style="list-style-type: none"> Where possible, construction works will be programmed to avoid disturbance during periods or in areas identified as being particularly sensitive following pre-construction surveys. This will include avoiding working along sections of the overhead line within areas where Schedule 1 species of birds are found to be nesting and avoiding undertaking any earthworks or soil stripping during prolonged periods of heavy rainfall. 	Avoid / Reduce

DESCRIPTION OF MITIGATION MEASURE		Mitigation Principle (Avoid / Reduce / Offset)
13.2 STAGE: PRE-CONSTRUCTION (continued)		
Identification of precise areas of woodland to be felled	<ul style="list-style-type: none"> A pre-construction survey will be undertaken to identify the precise areas of woodland to be felled. Advice on tree removal will be provided by a suitably qualified arborist. 	Reduce
Assessment of Windthrow Risk	<ul style="list-style-type: none"> Following identification of precise areas of woodland to be felled an assessment of the risk of windthrow from proposed felling will be made by a suitably qualified arborist. Where appropriate, management measures will be proposed for any affected sections of plantation; including 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. 	Reduce
13.3 STAGE: CONSTRUCTION		
Maintenance of Rights of Way, tracks and other access routes during construction	<ul style="list-style-type: none"> All temporary closures of Rights of Way and other such public paths will be clearly communicated to the public in advance. This will include, where appropriate, the provision of alternative access arrangements, diversions and the use of signage. Where appropriate traffic management measures will put in place to reduce impacts on traffic using the roads spanned by the overhead line. 	Reduce
Construction Areas and Wood Pole Structure Locations	<ul style="list-style-type: none"> Temporary access routes and construction areas will be kept to a minimum to ensure disruption to existing land uses are reduced. Sensitive sites and habitats will be demarcated from temporary access routes and construction areas so as to minimise the disturbance of land not required for development. Pre-construction surveys will inform the precise location of temporary access tracks and construction areas in order to ensure that disturbance of protected species including mammals and birds is kept to a minimum. 	Avoid / Reduce
Tree Felling and Lopping	<ul style="list-style-type: none"> Where trees are to be felled or lopped or such activities will be undertaken under the supervision of by a suitably qualified arborist. Tree felling and lopping will be kept to a minimum therefore limiting the impact on flora along the overhead line corridor. 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 land reinstatement process. Where possible tree felling required to facilitate construction and operation of the grid connection will be undertaken outwith the breeding bird season. 	Reduce
Disturbance to Protected Species (mammals and birds)	<ul style="list-style-type: none"> Where possible construction works will be programmed to avoid disturbance during periods or in areas identified as being particularly sensitive following pre-construction surveys. Where possible tree felling or vegetation clearance required to facilitate construction and operation of the grid connection will be undertaken outwith the breeding bird season. Where tree felling or vegetation clearance is required during the breeding season it will only be undertaken following a detailed breeding bird survey by a suitably qualified ecologist. Construction activities will be undertaken within defined areas to limit disturbance and will occur within set working hours so as to not impact on birds at dawn or dusk. Advice on appropriate working methods and standoff distances from sensitive areas, such as nesting sites of will be provided by a suitably qualified ecologist. Should any active Schedule 1 (Wildlife and Countryside Act 1981) species nest sites be identified during construction all works will be suspended within that area and advice sought from a suitably qualified ecologist on the most appropriate course of action. Where construction works have the potential to affect active nest sites a suitably qualified ecologist will supervise construction works. A detailed bat survey will be undertaken prior to the felling or lopping of potential woodland habitats. In the event that a bat roost is found works within that area will be temporarily suspended until the appropriate course of action is agreed with SNH. General disturbance such as noise and dust resulting from construction activities will be suitably managed; construction will follow British Standard 5228 <i>Noise and Vibration Control on Construction and Open Sites</i> and should dust arise, damping will be used. 	Avoid / Reduce
Disturbance of Archaeological Features	<ul style="list-style-type: none"> Wood pole structures will be microsited where appropriate to avoid directly impacting on archaeological sites or features. Where archaeological sites or features are affected by construction activities, an archaeological watching brief will be maintained during topsoil removal, earthworks and wood pole structure erection or cable trenching. Should earthworks for wood pole structures or cable trenches yield previously unknown archaeological remains construction works will be temporarily suspended. A suitably qualified archaeologist will be contacted, the remains inspected and appropriate method of preservation or removal identified. 	Avoid / Reduce

DESCRIPTION OF MITIGATION MEASURE		Mitigation Principle (Avoid / Reduce / Offset)
13.3 STAGE: CONSTRUCTION (continued)		
Pollution Prevention, Control and Response	<ul style="list-style-type: none"> All construction activities will be undertaken in accordance with SEPA Pollution Prevention Guidelines (PPGs) and the Controlled Activities Regulations (CAR) General Binding Rules (GBRs). Provision for containment and clean-up of the pollutants will be made. In the event of a spillage any oil or similar material will be cleaned away immediately using appropriate absorbent material to prevent it entering any local watercourse. The procedure will follow the recommendations in PPG21. In order to prevent materials leaking from static plant, such as pumps and generators, contaminating the ground and being washed into the drainage system, static plant will be placed on drip trays wherever practicable. Facilities for washing plant and equipment contaminated with mud will be provided. Washwater from the facilities will be collected and disposed so as to prevent pollution of surface water and groundwater. 	Avoid / Reduce
Works near Surface Watercourses	<ul style="list-style-type: none"> Works near watercourses will follow the guidance contained within the Forestry Commission: Forest and Water Guidelines. Watercourses will be demarcated from construction areas where possible to prevent unnecessary disturbance of channels and riparian habitats. Where appropriate bunds, buffer strips and oil interceptors will be placed between site compounds, storage areas and construction areas and surface watercourses in order to prevent sediment of contaminant loaded runoff draining directly into watercourses. Spill kits would be available at all construction areas and compounds in the vicinity of surface watercourses. Surface waters including field drains in the vicinity of construction activities will be regularly inspected to ensure that there are no blockages such as sediments that may impede flow and result in flooding. 	Avoid / Reduce
Management of Drainage and control of Flood Risk	<ul style="list-style-type: none"> During preparation works temporary drainage to ensure controlled management of runoff draining from the construction site will be prepared. This will be based on the guidance contained within CIRIA Document C521 "Sustainable Urban Drainage Systems – Design Manual for Scotland and Northern Ireland". Runoff from construction areas or compounds will not be allowed to drain directly into any watercourse and temporary SUDS will be used to ensure that runoff filtered and attenuated using silt traps, silt mats or fences, filter strips, cut-off drains, oil interceptors and settlement ponds as appropriate. Trenches will be backfilled as soon as is practicable in order to prevent them acting as conduits for surface runoff. Water pumped from excavations will be directed to a settlement pond or tank to allow for removal of suspended solids prior to discharge. 	Reduce
Earthworks and Soil Stripping	<ul style="list-style-type: none"> Earthworks will be undertaken in accordance with <i>British Standard 6031 Code of Practice for Earth Works</i>. Where possible top soil stripping excavation will be undertaken during drier periods so as to reduce the potential for mobilisation of exposed soil and/or sediment. During prolonged periods of heavy rainfall no topsoil stripping or earthworks will occur in order to reduce the potential for erosion and sedimentation. 	Avoid / Reduce
Storage of materials including excavated soils	<ul style="list-style-type: none"> A minimal amounts of fuels, oils and such like will be stored in site compounds. These will be stored in secure and designated storage areas and in accordance with the appropriate regulatory requirements, including COSHH Regulations 1994. Storage areas will all be located on hardstanding areas so as to prevent the possible infiltration of contaminants into soil and groundwater. Excavated materials and stored top soils will be stored in bunded areas to prevent mobilisation. Stockpiling of materials on floodplains or adjacent to watercourses will be avoided where possible. Where top soils and excavated materials are stored within the floodplain they will be stored within a bunded area in order to prevent mobilisation by surface runoff. Excavated peat will be stored for short periods of time in order to prevent it drying out. 	Avoid / Reduce
Management of Damage to Vegetation and Soils	<ul style="list-style-type: none"> Movement of construction vehicles and plant will be controlled in order to minimise the potential for soil compaction and erosion. Excavated materials will be appropriately stored and used to backfill wood pole excavations and cable trenches. All land temporarily affected by construction will be restored following construction. Surplus soils will be used in the reinstatement of affected land and spread around the construction areas. A suitably qualified ecologist will advise on the micro-siting of wood pole structure locations in a number of areas identified as sensitive: <ul style="list-style-type: none"> Bryophyte springs and flushes Steep valley at NW corner of Windrow Wood Sloped wood pasture to the west of Millers Wood Derelict ground to the west of the bing at Glaikehead. Where appropriate an ecologist will advise on micro-siting wood poles structures and the removal and reinstatement of top soil and vegetation. 	Avoid / Reduce

DESCRIPTION OF MITIGATION MEASURE		Mitigation Principle (Avoid / Reduce / Offset)
13.3 STAGE: CONSTRUCTION (continued)		
Control of Construction Noise	<ul style="list-style-type: none"> Construction activities will be undertaken in accordance with the guidance contained within <i>British Standard 5228 Noise and Vibration Control on Construction and Open Sites</i>. 	Reduce
Control and Disposal of Waste	<ul style="list-style-type: none"> The generation of waste will be minimised as much as possible through re-use of materials. All excavated materials and any mulched trees will be used during the reinstatement of affected land. Waste materials will be removed from site and disposed of in an appropriate manner in accordance with the Waste (Scotland) Regulations 2005 and other associated legislation. 	Reduce
13.4 STAGE: POST-CONSTRUCTION		
Control and Disposal of Waste	<ul style="list-style-type: none"> A post construction walkover of the overhead line will be undertaken in order to ensure that all waste materials have been removed. 	Reduce
Post construction monitoring	<ul style="list-style-type: none"> A walkover survey of the overhead line will be undertaken to ensure that the affected areas including top soils and vegetation have been appropriately reinstated and habitats not impacted upon. Collision risk is not predicted to result in significant effects and bird deflectors are not proposed, however, should the results of pre-construction surveys indicate that collision risk will have a significant effect bird deflectors will be installed as appropriate on the affected sections of the overhead line. 	Reduce
Maintenance of Wayleaves	<ul style="list-style-type: none"> Where wayleaves require to be maintained by felling or lopping during the lifetime of the overhead line such activities will be undertaken by a suitably qualified arborist. Where possible regular maintenance will be timed such that it occurs outwith the breeding period. Where emergency maintenance is required this may not be possible. Where appropriate maintenance activities will be undertaken following a breeding bird survey by a suitably qualified ecologist. 	Avoid / Reduce
Maintenance Works	<ul style="list-style-type: none"> The mitigation put in place during construction will apply during any maintenance works. This will include timing of works to minimise disturbance to land, flora and fauna and putting in place appropriate pollution prevention and control measures. 	Avoid / Reduce

Glossary and Abbreviations

Baseline Conditions	The conditions against which potential effects arising from the Scheme are identified and evaluated.	National Monuments Record of Scotland	National database of archaeological remains, historic buildings and other sites of interest, held by the Royal Commission on the Ancient and Historic Monuments of Scotland in Edinburgh.
Biodiversity	Genetically determined variability amongst living organisms, including the variability within species, between species, and of ecosystems. Abbreviated from 'biological diversity'.	Notable Species	Species that are recognised (e.g. as rare, scarce, flagship, etc.) as warranting particular attention in a legal or local policy context.
Biodiversity Action Plan (BAP)	Action plans (which are on both national and local scales) through which biodiversity objectives are set out.	Phase 1 Habitat Survey	A standard ecological survey technique devised by the Joint Nature Conservation Committee that identifies and maps the main habitat types in an area.
Conservation Area	Designation given by the Local Authority to areas of settlements, the character or appearance of which it is considered desirable to preserve and enhance.	Receptor	Receptors comprise anything that may be affected by an environmental impact, be this human beings, socio-economic activity, habitats, species, controlled waters, landscape or cultural heritage.
Designated Sites	Sites, such as Sites of Special Scientific Interest (SSSI) or Scheduled Ancient Monuments (SAM), identified and protected by national or international legislation.	Residual Impacts	Environmental Impacts remaining after mitigation measures have been taken.
Distribution Overhead Line	Low voltage electricity lines. 33kV and below.	Resource	A biophysical feature or item of 'environmental capital'; examples include habitats, aquifers, agricultural land, views, access routes and community facilities.
Ecology	The study of the relationships between living organisms and between organisms and their environment.	Riparian	Relating to a river bank.
Environmental Impact Assessment	A systematic means of assessing a project's likely significant environmental impacts and effects.	Ruderal	Plants characteristic of waste ground and other disturbed and marginal habitats.
Environmental Impact/ Effect	A change in the existing environment caused directly or indirectly by the scheme or development.	Scheduled Ancient Monument	A monument considered of national importance and which is listed on a statutory schedule. Permission must be sought from Historic Scotland before any excavation or development work is carried out on, or around a Scheduled Monument.
Environmental Statement	Document that reports the findings of an Environmental Impact Assessment.	Scoping	The stage of EIA during which its scope is determined. Involves identification of significant issues that require assessment.
Fauna	The animals of a specified area.	Severance	Where the scheme would reduce access by acting as a physical barrier. Generally, severance applies to pedestrians and road users.
Forestry Wayleave	Cleared corridor within woodland. Required to achieve minimum clearance and safety	Significant or Substantial Impact	Where Environmental Impacts are moderate or major after mitigation has taken place.
Flora	The plants of a specified area.	Spatial	Of, or relating to, geographical space.
Habitat	The environment in which a species lives at any stage of its life cycle.	Special Area of Conservation (SAC)	An area designated for protection under the Habitats Directive. A cSAC is a <i>candidate</i> SAC, which is afforded the same protection as a full SAC. Such sites are also <i>Natura 2000</i> sites or <i>European Sites</i> .
Hydrogeology	Pertaining to groundwater, i.e. water present in soils, superficial deposits such as sands and gravels and in bedrock.	Special Protection Area (SPA)	An area designated for protection under the Birds Directive. A pSPA is a <i>proposed</i> SPA. Such sites are also <i>Natura 2000</i> sites or <i>European Sites</i> .
Hydrology	The study of water systems.	Species	A group of closely-related organisms sharing constant differences from allied groups.
Landscape	Those physical components, which together form the appearance of land, including its shapes, colours and textures. Landscape also reflects the way in which these various components combine to create distinctive landscape characters that are particular to localities.	Sustainable	Relating to sustainable development: development, which takes equal account of economic, social, and environmental requirements.
Landscape Character Areas	Discrete areas, defined by specific homogeneous landscape components, for example: landform, land cover vegetation, settlement pattern, remoteness and degree of tranquillity.	Temporal	Of, or relating, to time.
Listed Building	A building or structure included on the Statutory List of Buildings of Special Architectural or Historic Interest compiled by the Scottish Ministers. Buildings are graded A, B and C (s).	Transmission Overhead Line Utilities	High voltage electricity lines. 132kV and above.
Local Plan	Documents produced by Local Authorities setting out their policies regarding planning issues within a specific area.	Visual Receptors	Generally, buried services such as gas, electricity, water, sewerage and telecommunications.
Mitigation	Measures taken to avoid, reduce or offset environmental impacts. Mitigation can moderate adverse effects and enhance the beneficial ones arising from the whole or specific elements of the Scheme.	Wildlife Corridor	A linear feature that is likely to be used by wildlife to move between various areas.

Glossary and Abbreviations

Zone of Theoretical Visibility	The zone within which views of the proposed development may be achieved. It is influenced by many factors including topography and intermediate visual intrusions, such as blocks of woodland and buildings.	HAP	Habitat Action Plan
AGLV	Area of Great Landscape Value	HGDL	Historic Gardens and Designed Landscape
AOD	Above Ordnance Datum	HGV	Heavy Good Vehicle
ASSI	Area of Special Scientific Interest	HPA	Health Protection Agency
AWF	Andershaw Windfarm	HSE	Health and Safety Executive
AWI	Ancient Woodland Inventory	IEEM	Institute of Ecology and Environmental Management
BAP	Biodiversity Action Plan	IEMA	Institute of Environmental Management and Assessment
BBS	Breeding Bird Survey	ICNIRP	International Commission on Non-Ionizing Radiation Protection
BOCC	Birds of Conservation Concern	JNCC	Joint Nature Conservation Committee
BS	British Standard	LBAP	Local Biodiversity Action Plan
BTO	British Trust for Ornithology	LCA	Landscape Character Assessment
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2005	LCLP	Lower Clydeside Local Plan
CD	Consultation Document	LCT	Landscape Character Type
CS	Coalburn Substation	LHWF	Limmer Hill Windfarm
cSAC	Candidate Special Area of Conservation	LLCA	Local Landscape Character Areas
DTM	Digital Terrain Model	LNR	Local Nature Reserve
EIA	Environmental Impact Assessment	LVASG	Landscape & Visual Assessment Supplementary Guidance (Scot Exec 2002)
EMP	Environmental Management Plan	MEWP	Mobile Elevated Working Platforms
EMF	Electric and Magnetic Fields	NG	National Grid
EMS	Environmental Management System	NGR	National Grid Reference
ES	Environmental Statement	NMRS	National Monuments Record of Scotland
ESI	Electricity Supply Industry	NNR	National Nature Reserve
EU	European Union	NPF	National Planning Framework for Scotland
FCS	Forestry Commission Scotland	NPPG	National Planning Policy Guidance
FM	Faber Maunsell Ltd	NTS	Non-Technical Summary
FRS	Fisheries Research Services	NVC	National Vegetation Classification
GBR	General Binding Rule	OCCS	Open Cast Coal Site
GCVJSP	Glasgow Clyde Valley Joint Structure Plan	OHL	Overhead Line
GIS	Geographic Information System	OS	Ordnance Survey
GLVIA	Guidelines for Landscape and Visual Impact Assessment	PAN	Planning Advice Notes
		PPG	Pollution Prevention Guidelines
		PRW	Public Right of Way
		pSPA	Potential Special Protection Area
		RBD	River Basin Districts
		RIGS	Regionally Important Geological Site

Glossary and Abbreviations

RSA	Regional Scenic Area
RCAHMS	The Royal Commission on the Ancient and Historical Monuments of Scotland
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAM	Scheduled Ancient Monument
SD	Scoping Document
SEPA	Scottish Environment Protection Agency
SHETL	Scottish Hydro Electric Transmission Ltd
SINCS	Sites of Importance for Nature Conservation
SLLP	South Lanarkshire Local Plan
SMR	Sites and Monuments Record.
SNAWI	Semi Natural Ancient Woodland Inventory
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Scottish Planning Policy
SPT	ScottishPower Transmission Ltd
SSRSG	South Strathclyde Raptor Study Group
SSSI	Site of Special Scientific Interest
SWT	Scottish Wildlife Trust
UK	United Kingdom
UKCCS	United Kingdom Childhood Cancer Research Group
VP	Vantage Point
VPS	Vantage Point Survey
WEWS	Water Environment and Water Services Act
WCA	Wildlife and Countryside Act 1981, as amended
WFD	Water Framework Directive
WoSAS	West of Scotland Archaeological Service
ZTV	Zone of Theoretical Visibility

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 Planning Advice Note (PAN) 58 Environmental Impact Assessment
 Planning Advice Note (PAN) 60 Planning for Natural Heritage
 Planning Advice Note (PAN) 68 Design Statements
 Planning Advice Note (PAN) 69 Planning and Building Standards Advice on Flooding
 Planning Advice Note (PAN) 75 Planning for Transport
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 Pollution Prevention Guideline 05 - Works In, Near or Liable to Affect Watercourses
 Pollution Prevention Guideline 06 - Working at Construction and Demolition Sites
 Pollution Prevention Guideline 09 - Pesticides
 Pollution Prevention Guideline 21 - Pollution Incident Response Planning
 Pollution Prevention Guideline 23 - Maintenance of Structures Over Water
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Planning Advice Note (PAN) 51 Environmental Protection and Regulation
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 Planning Advice Note (PAN) 60 Planning for Natural Heritage
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Andershaw to Coalburn 132kV Overhead Line Volume 3: Appendices

Appendix A: Overhead Line Routeing Guidance

Holford Rules Guidelines with NG and SHETL Notes

Notes:

Holford Rules are in bold.

Notes are National Grid (NG) 1992 notes.

Notes in italics are Scottish Hydro Electric Transmission Ltd (SHETL) 2003 notes.

RULES 1-7

Rule 1

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

Note on Rule 1

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

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

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

Special Areas of Conservation (NPPG14)

Special Protection Areas (NPPG14)

Ramsar sites (NPPG14)

National Scenic Areas (NPPG14)

National Parks (NPPG14)

National Nature Reserves (NPPG14)

Protected Coastal Zone Designations (NPPG13)

Sites of Special Scientific Interest (SSSI) (NPPG14)

Schedule of Ancient Monuments (NPPG5)

Listed Buildings (NPPG18)

Conservation Areas (NPPG18)

World Heritage Sites (a non-statutory designation) (NPPG18)

Historic Gardens and Designed Landscapes (a non-statutory designation) (NPPG18)

Rule 2

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

Note on Rule 2

a) Small areas of highest amenity value not included in Rule 1 as a result of their spatial extent should be identified along with other areas of regional or local high amenity value identified from development plans.

b) Effects on the setting of historic buildings and other cultural heritage features should be minimised.

c) If there is an existing transmission line through an area of high amenity value and the surrounding land uses have to some extent adjusted to its presence, particularly in the case of commercial forestry, then the effect of remaining on this line must be considered in terms of the effect of a new route deviating around the area.

Rule 3

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

Note on Rule 3

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

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

Rule 4

Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible; and where the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely

when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.

Rule 5

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

Notes on Rules 4 and 5

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

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

c) *Where possible follow open space and run alongside, not through woodland or commercial forestry, and consider opportunities for skirting edges of copses and woods. Where there is no reasonable alternative to cutting through woodland or commercial forestry, the Forestry Commission Guidelines should be followed (Forest Landscape Design Guidelines, second edition, The Forestry Commission 1994 and Forest Design Planning – A Guide to Good Practice, Simon Bell/The Forest Authority 1998).*

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

Rule 6

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

Note on Rule 6

a) In all locations minimise confusing appearance.

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

Rule 7

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

Note on Rule 7

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

Explanatory Note on Rule 7

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

Supplementary Notes

a) Residential Areas

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

b) Designations of Regional and Local Importance

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

c) Alternative Lattice Steel Tower Design

In addition to adopting appropriate routeing, evaluate where appropriate the use of alternative lattice steel tower designs available where these would be advantageous visually, and where the extra cost can be justified. [Note: SHETL has reviewed the visual and landscape arguments for the use of lattice steel towers in Scotland and summarised these in a document titled 'Overhead Transmission Line Tower Study 2004'].

Further Notes on Clarification to the Holford Rules

Line Routeing and People

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

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

Supplementary Notes on the Siting of Substations

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

- b) Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas.
- c) Use space effectively to limit the area required for development, minimising the effects on existing land use and rights of way.
- d) Alternative designs of substations may also be considered, e.g. 'enclosed', rather than 'open', where additional cost can be justified.
- e) Consider the relationship of towers and substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints.
- f) When siting substations take account of the effects of line connections that will need to be made.

FORESTRY COMMISSION GUIDELINES

1. Route transmission lines to follow open space and to run alongside, not through woodland.
2. Where there is no alternative route; a power line through the forest should:
 - Avoid areas of landscape sensitivity.
 - Avoid the line of sight of important views.
 - Be kept in valleys and depressions.
 - Not divide a hill into two similar parts where it crosses over a summit.
 - Cross skyline or ridges where they drop to a low point.
 - Follow alignments diagonal to the contour as far as possible.
 - Be inflected upwards in hollows and downward in ridges.
3. Design of the transmission line corridor:

Within the forest the transmission line should seem through a series of irregular spaces. The forest should appear to meet across open space in some places so that the corridor does not split the forest completely. An even width of corridor is not obligatory because trees can be planted closer to the conductor opposite support towers than in mid-span, where the conductor hangs lower and swings more. Smaller trees and shrubs can be grown closer still, as an extension of the forest edge towards the power line. This edge should be designed to create irregular spaces with irregular tree heights, avoiding severe vertical edges, particularly to conifers. The aim should be a corridor of varying character and width, swinging from one side of the line to the other, taking care to avoid irregular but parallel edges, or irregular but symmetrical spaces. Exit points should be gently asymmetrical bell-mouths. Felling areas should be planned to link with and cross the power line corridor and create greater irregularity.

Appendix B: Alternative Overhead Line Routes

Alternative Routes

Background

The routing study was undertaken between January 2007 and reported on in the Consultation Document published in June 2008. The original study considered grid connections to Coalburn substation from Andershaw windfarm and Limmer Hill windfarm, to the east of Andershaw on the opposite side of the M74. This included consideration of single connections for the two sites and due to their proximity combined connections.

Over the lifetime of the project the developers of the proposed windfarm at Limmer Hill withdrew their proposal resulting in the cancellation of their connection agreement with Scottish Power Transmission (SPT). As such only alternative connections relevant to the proposed Andershaw windfarm have been described within the ES.

Alternative Routes

The relative alternatives illustrated here are referred to in the Consultation Document as Options B to F. The following annotated figures have been taken from the Consultation Document, these provide an overview of the five alternatives and describe the key routing constraints and opportunities associated with them.

The figures are as follows:

Figure B1: Option A

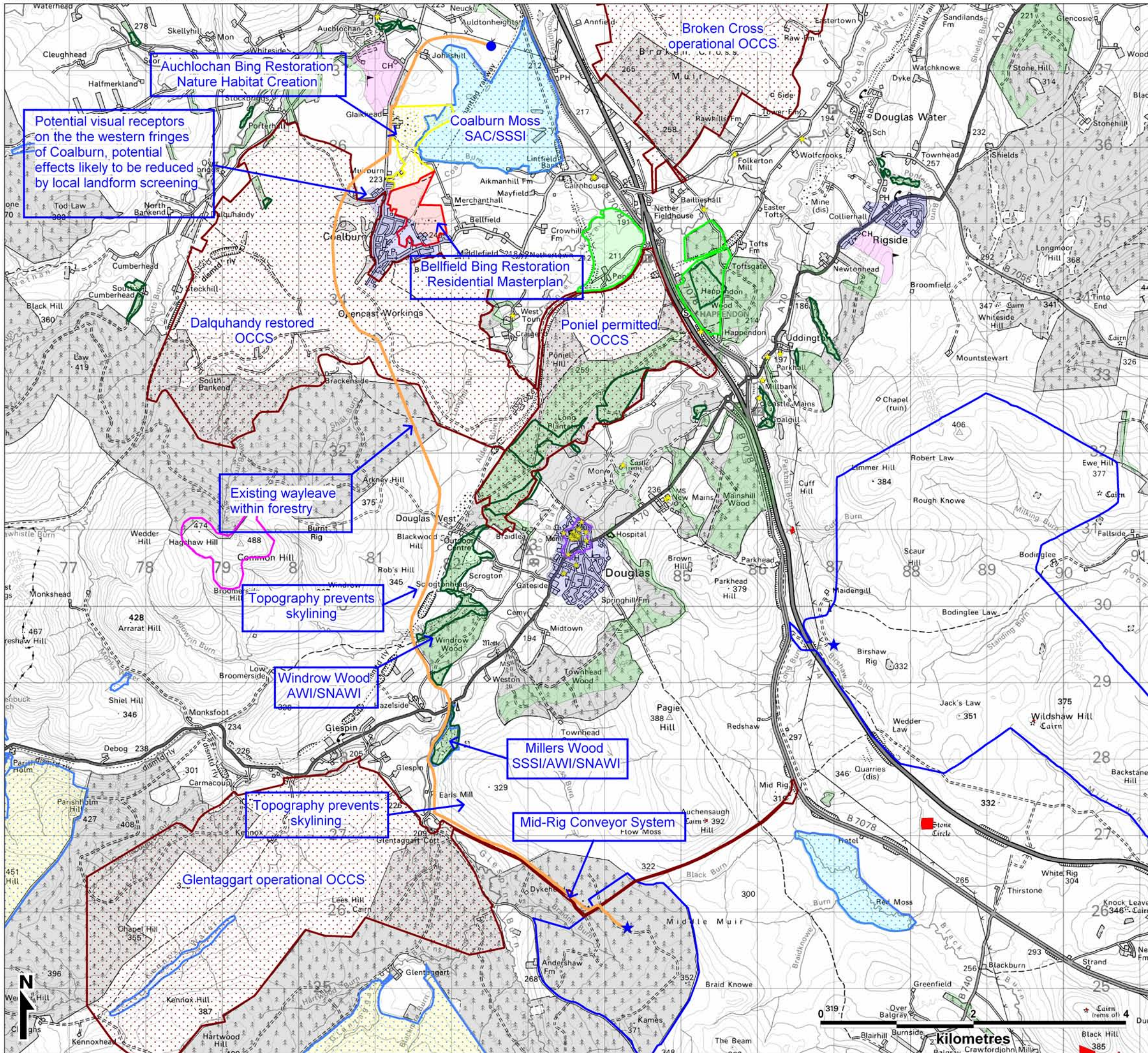
Figure B2: Option B

Figure B3: Option C

Figure B4: Option D

Figure B5: Option E

Figure B6: Option F



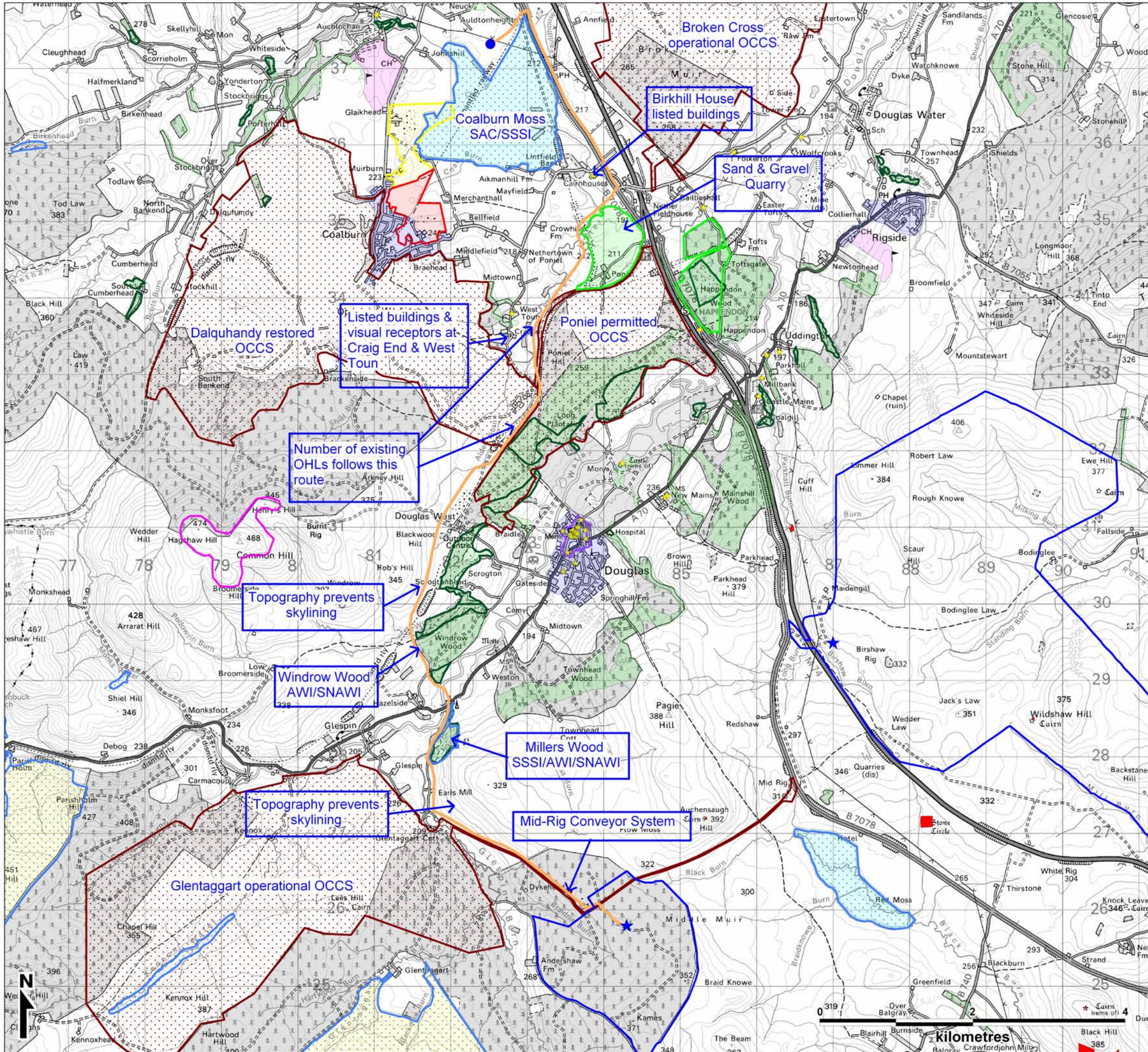
Legend

- Option A
- Coalburn Substation
- Windfarm Substation
- Windfarm Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Semi Natural Woodland Inventory (SNAWI)
- Scheduled Ancient Monument (SAM)
- Listed Building
- Conservation Area
- Opencast Coal Site (OCCS)
- SRG owned development land
- Auchlochan Bing Restoration Plan: Nature Habitat Creation
- Bellfield Bing Restoration Proposal: Coalburn Housing Masterplan
- Existing Windfarm at Hagshaw Hill
- Settlements
- Golf Courses



Project	Andershaw - Coalburn Proposed 132kV Overhead Line		
Title	Figure B1: Option A		
Scale	1: 50,000	Drawn by	D.Ritchie
Date	May '07	Checked by	R. Kirby
		Rev.	1

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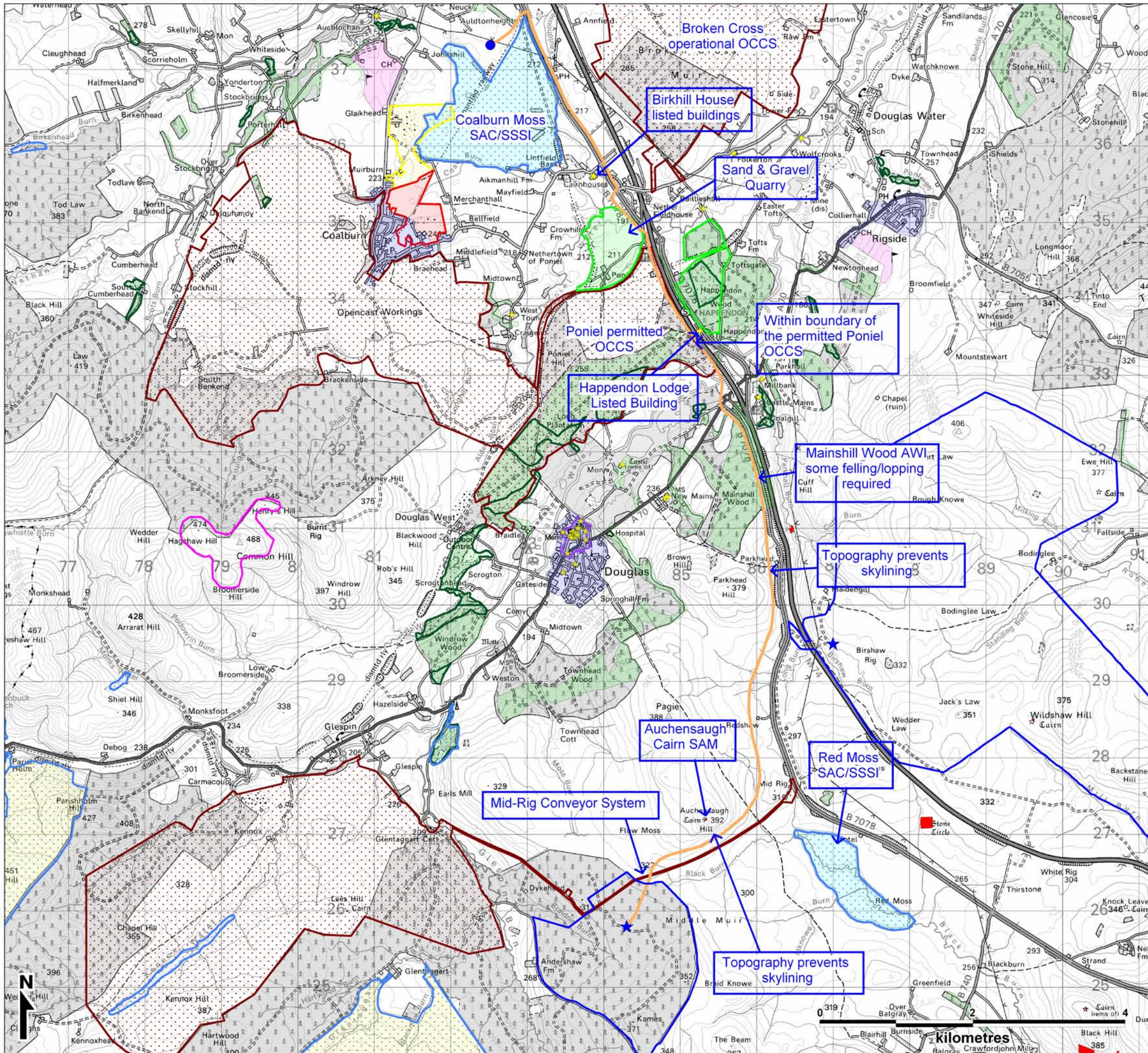
Legend

- Option B
- Coalburn Substation
- Windfarm Substation
- Windfarm Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Semi Natural Woodland Inventory (SNAWI)
- Scheduled Ancient Monument (SAM)
- Listed Building
- Conservation Area
- Opencast Coal Site (OCCS)
- SRG owned development land
- Auchlochan Bing Restoration Plan: Nature Habitat Creation
- Bellfield Bing Restoration Proposal: Coalburn Housing Masterplan
- Existing Windfarm at Hagshaw Hill
- Settlements
- Golf Courses



Project	Andershaw - Coalburn Proposed 132kV Overhead Line		
Title	Figure B2: Option B		
Scale	1: 50,000	Drawn by	D. Ritchie
Date	May '07	Checked by	R. Kirby
		Rev.	1

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Legend

- Option C
- Coalburn Substation
- Windfarm Substation
- Windfarm Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Semi Natural Woodland Inventory (SNAWI)
- Scheduled Ancient Monument (SAM)
- Listed Building
- Conservation Area
- Opencast Coal Site (OCCS)
- SRG owned development land
- Auchlochan Bing Restoration Plan: Nature Habitat Creation
- Bellfield Bing Restoration Proposal: Coalburn Housing Masterplan
- Existing Windfarm at Hagshaw Hill
- Settlements
- Golf Courses

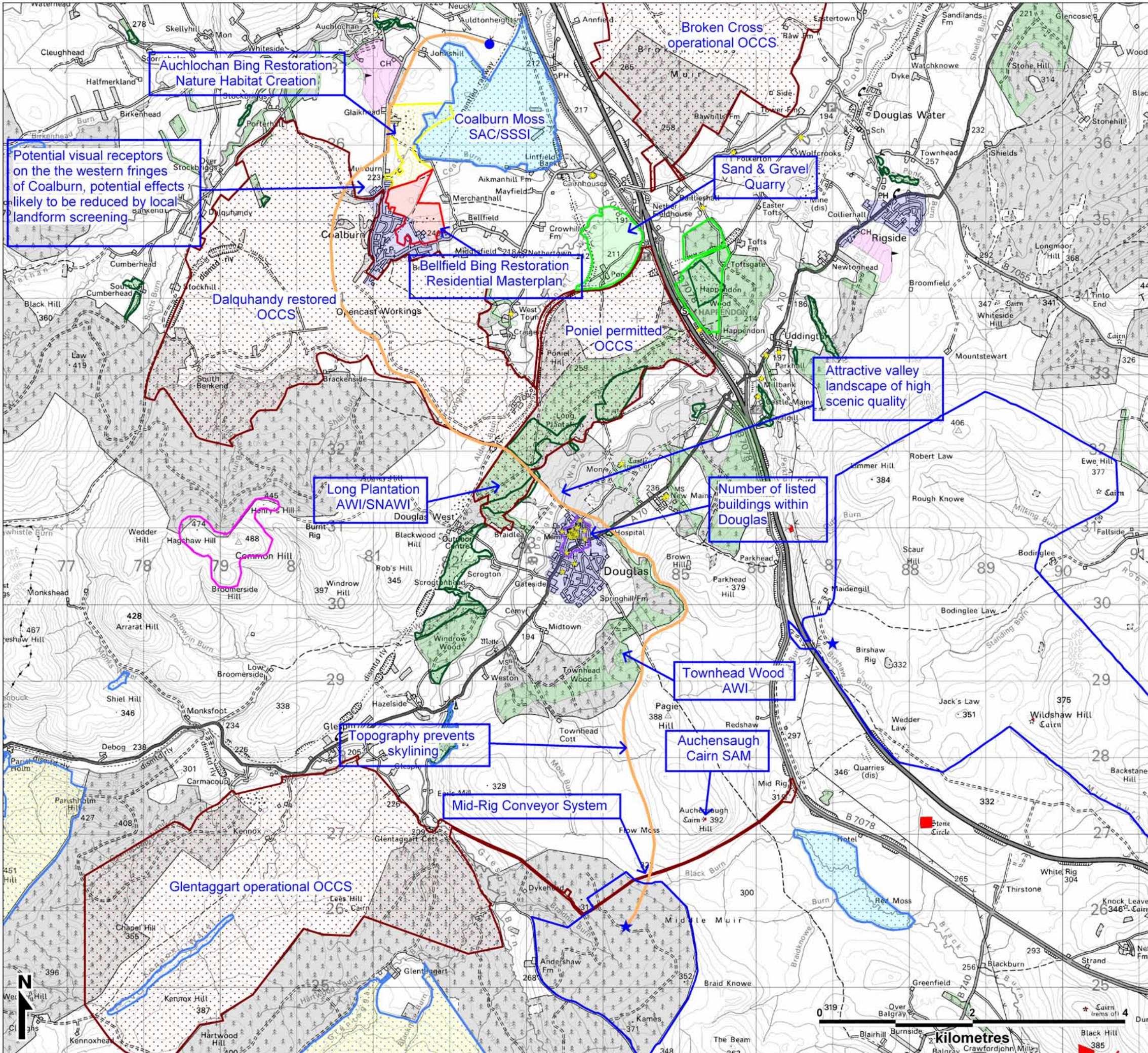


Project Andershaw - Coalburn
Proposed 132kV Overhead Line

Title Figure B3:
Option C

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Date	May '07	Checked by	R. Kirby	1

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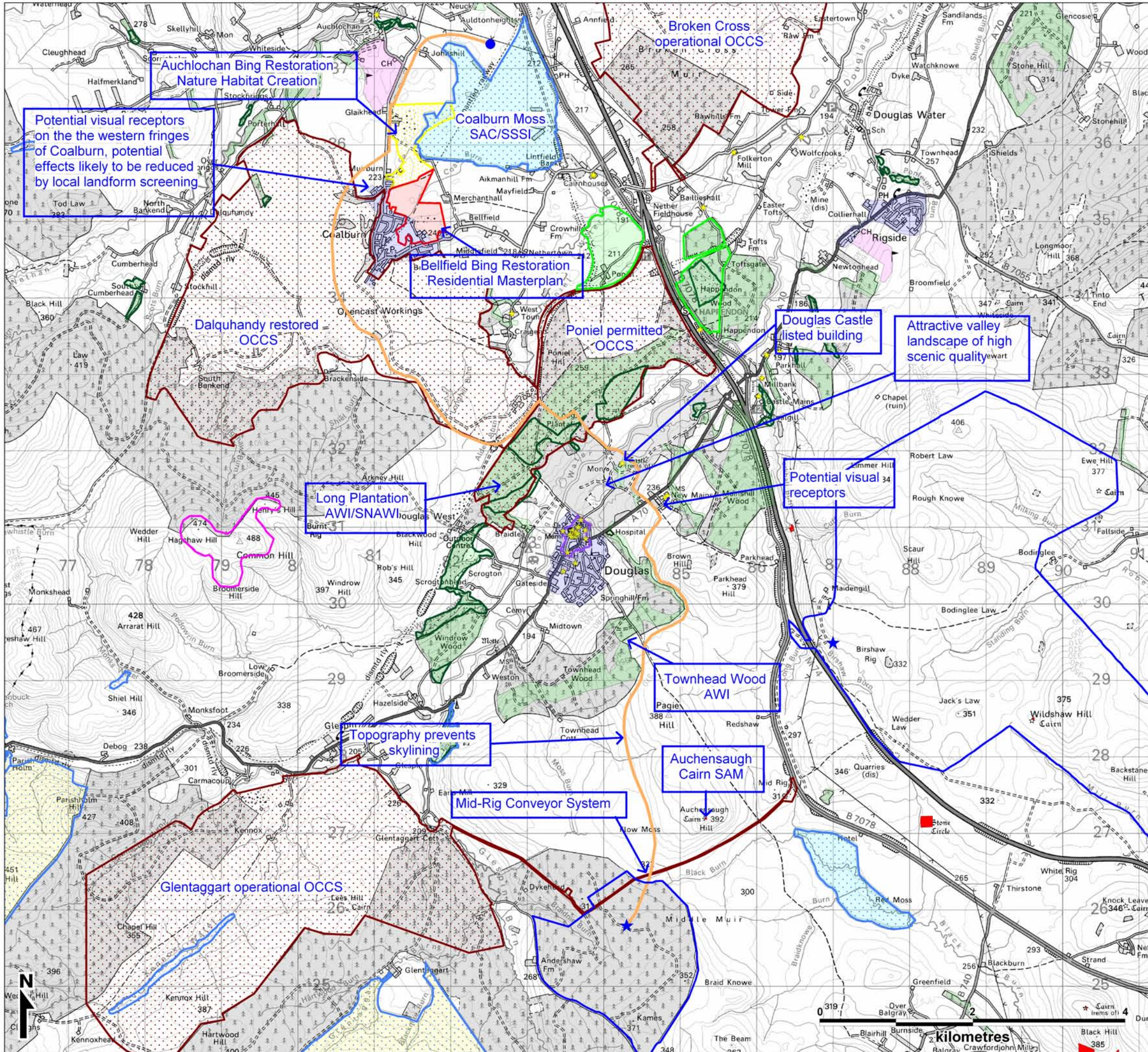


Legend

- Option D
- Coalburn Substation
- Windfarm Substation
- Windfarm Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Semi Natural Woodland Inventory (SNAWI)
- Scheduled Ancient Monument (SAM)
- Listed Building
- Conservation Area
- Opencast Coal Site (OCCS)
- SRG owned development land
- Auchlochan Bing Restoration Plan: Nature Habitat Creation
- Bellfield Bing Restoration Proposal: Coalburn Housing Masterplan
- Existing Windfarm at Hagshaw Hill
- Settlements
- Golf Courses

Project	Andershaw - Coalburn Proposed 132kV Overhead Line		
Title	Figure B4: Option D		
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Date	May '07	Checked by	R. Kirby
Rev.			1

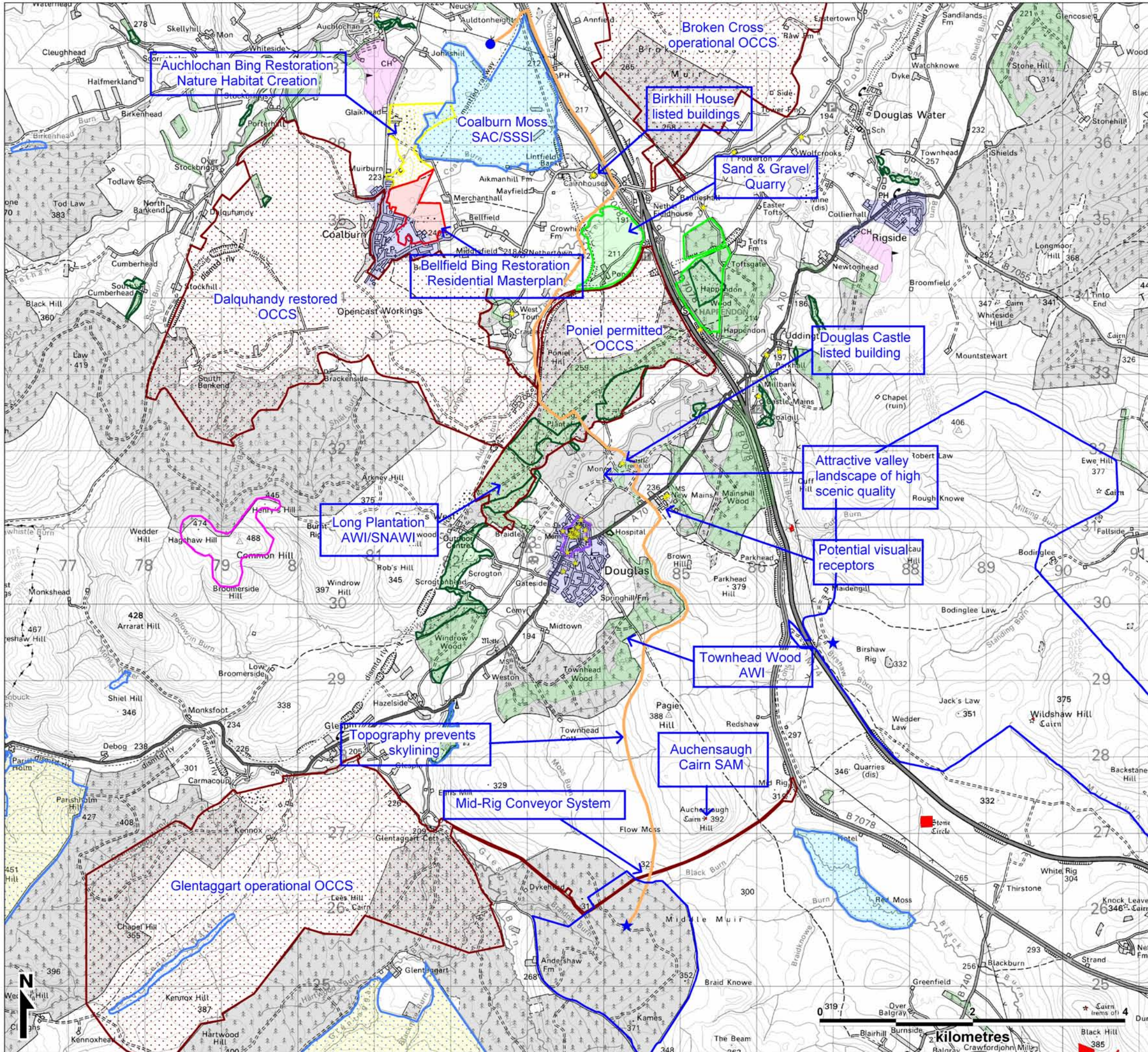
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Legend


- Option E
- Coalburn Substation
- ★ Windfarm Substation
- Windfarm Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Semi Natural Woodland Inventory (SNAWI)
- Scheduled Ancient Monument (SAM)
- ★ Listed Building
- Conservation Area
- Opencast Coal Site (OCCS)
- SRG owned development land
- Auchlochan Bing Restoration Plan: Nature Habitat Creation
- Bellfield Bing Restoration Proposal: Coalburn Housing Masterplan
- Existing Windfarm at Hagshaw Hill
- Settlements
- Golf Courses

Project	Andershaw - Coalburn Proposed 132kV Overhead Line		
Title	Figure B5: Option E		
Scale	1: 50,000	Drawn by	D.Ritchie
Date	May '07	Checked by	R. Kirby
		Rev.	1



Legend

- Option F
- Coalburn Substation
- Windfarm Substation
- Windfarm Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Semi Natural Woodland Inventory (SNAWI)
- Scheduled Ancient Monument (SAM)
- Listed Building
- Conservation Area
- Opencast Coal Site (OCCS)
- SRG owned development land
- Auchlochan Bing Restoration Plan: Nature Habitat Creation
- Bellfield Bing Restoration Proposal: Coalburn Housing Masterplan
- Existing Windfarm at Hagshaw Hill
- Settlements
- Golf Courses



Project	Andershaw - Coalburn Proposed 132kV Overhead Line		
Title	Figure B6: Option F		
Scale	1: 50,000	Drawn by	D.Ritchie
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		Rev.	1

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