

Environmental Appraisal

Tralorg Wind Farm 33 kV
Overhead Line and Under-
ground Cable Connection to
Mark Hill Substation

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 RAMBOLL

 SP ENERGY
NETWORKS

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1. INTRODUCTION

1.1 Preamble

Scottish Power Energy Networks (SP Energy Networks) is proposing to construct and operate a new 33 kV wood pole overhead line (OHL) in conjunction with a section of underground cable, to connect the consented Tralorg wind farm to grid substation at Mark Hill, north of Barrhill in South Ayrshire (hereafter, 'the proposed development'). The location of the proposed development, including the location of the consented Tralorg wind farm and the Mark Hill substation, is shown on Figure 1.1.

SP Energy Networks, as the transmission license holder in southern Scotland, will obtain any necessary consents and land rights to install and operate the grid connection. In terms of its licence for the transmission of electricity, SP Energy Networks is obliged by law to develop and maintain an efficient, co-ordinated and economic system of electricity transmission and to facilitate competition in the supply and generation of electricity. SP Energy Networks is also responsible for developing the transmission system and connecting new demand and generation to the grid network in accordance with the GB Security and Quality of Supply Standards.

This Environmental Appraisal provides information to support an application for consent under *section 37 of the Electricity Act 1989*, and deemed consent under *section 57(2) of the Town and Country Planning (Scotland) Act 1997*, as amended, for the OHL section of the proposed development. The underground cable is considered to be ancillary development to that proposed in the application for consent under section 37 of the Electricity Act 1989.

In addition, environmental information is also provided in order to meet the applicant's obligations to preserve amenity and mitigate environmental effects under Schedule 9 of the *Electricity Act 1989*.

1.2 Background and Need for the Proposed Development

The Scottish Government granted consent for Tralorg Wind Farm under section 36 (s. 36) of the *Electricity Act 1989* in February 2014¹ which included deemed consent under *the Town and Country Planning (Scotland) Act 1997*. The consent is for construction and operation of the wind farm with a generation capacity of up to 18.8 MW. The wind farm substation will be constructed at the eastern end of the wind farm site (see Figure 1.1). In order to connect it to the transmission network a 33 kV connection from the wind farm is required.

1.3 Environmental Appraisal Process

SP Energy Networks submitted a written request in March 2017 for a screening opinion from the Scottish Government Energy Consents Unit (ECU) on the need for Environmental Impact Assessment (EIA) under regulation 5 of the *Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended)* (the EIA regulations). A screening opinion was received from the ECU on 5th May 2017, which confirmed that the proposed development does not constitute EIA development.

An Environmental Appraisal has been undertaken which provides environmental information, as set out in the request for a screening opinion, and addresses issues raised through pre-application consultation with statutory consultees. Further information on the pre-application consultation process is provided in Chapter 4. For the avoidance of doubt, this report does not form an "Environmental Statement" under the EIA regulations.

¹ <http://www.pnewind.co.uk/projects/current-projects/tralorg/>

Environmental input into the report has been collated by Ramboll Environment and Health UK Ltd (Ramboll), with technical environmental appraisals carried out by the following consultants:

- Landscape and Visual – Ramboll;
- Cultural Heritage and Archaeology – CFA Archaeology Ltd;
- Ecology and Ornithology – Ramboll;
- Hydrology and Soils – Ramboll; and
- Forestry – RTS Ltd.

1.4 Structure of this Report

This report is structured as follows:

- Chapter 1 – Introduction: describes the background to the Tralorg grid connection;
- Chapter 2 – Route Selection: outlines the process by which the route and final alignment was selected and describes the reasons why other route options were discounted;
- Chapter 3 – Proposed Development: describes the proposed development and provides detail of typical construction methods;
- Chapter 4 – Consultation: describes the stakeholder consultation undertaken to date;
- Chapter 5: Landscape and Visual Appraisal: describes the potential landscape and visual impact of the proposed development and how this has been mitigated through design;
- Chapter 6: Cultural Heritage Appraisal: describes the potential impact of the proposed development on the historic environment, and presents mitigation measures that will be implemented to reduce adverse effects;
- Chapter 7: Ecology and Ornithology Appraisal: describes the baseline ecological environment and information gathered from ornithology surveys, potential impacts on the ecological environment and ornithology and how these impacts will be mitigated;
- Chapter 8 – Hydrology and Hydrogeology Appraisal: describes the baseline environment, potential impact of the proposed development on water and soils, and how these impacts will be mitigated;
- Chapter 9 – Forestry Appraisal: describes the potential impact of the proposed development on surrounding woodland and presents mitigation measures; and
- Chapter 10 – Summary and Schedule of Mitigation: provides a summary of the appraisals undertaken and lists the mitigation measures identified.

Technical Appendices included at the end of the report contain technical information relating to specific assessments as referred to in the text.

2. ROUTE SELECTION

2.1 Aim of the Process

SP Energy Networks is obliged under *section 9 of the Electricity Act 1989* 'to develop and maintain an efficient, co-ordinated and economical system of electricity transmission and to facilitate competition in the supply and generation of electricity'. In addition, SP Energy Networks has a duty under *Schedule 9 of the Electricity Act 1989* to take account of 'the desirability of preserving natural beauty, of conserving flora, fauna, geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic interest and sites and structures of archaeological interest'. It is also required to take reasonable steps to mitigate the effects of its proposals.

The aim of the route selection process was to identify a proposed alignment which is technically feasible and economically viable and which causes the least disturbance to the environment; and those living in it, working in it, visiting it or using it for recreational purposes.

2.2 Methodology

The proposed alignment was identified through an iterative process supported by desk-based analysis, ground conditions and field surveys, engineering studies and landowner related assessments. It was developed in accordance with SP Energy Networks guidance². The guidance recommends appropriate application of the 'Holford Rules' to inform routeing. These rules advocate the application of a hierarchical approach to routeing which first avoids major areas of highest amenity, then smaller areas of high amenity, and finally considers factors such as backdrop, woodland and orientation.

The proposed alignment was identified based on the following key considerations:

- Avoidance, where possible, of key environmental constraints identified from online searches;
- Minimising exposure to high altitudes (over 200 m Above Ordnance Datum);
- Avoidance, or identification of most suitable crossing locations of roads and watercourses;
- Proximity to access tracks and roads;
- Configuration of and approach to termination points;
- Identification of main topographical and geotechnical features; and
- General landscape and visual amenity (backcloth and screening).

The initial desk studies were generally carried out with reference to the following information:

- Publicly available satellite imagery;
- Current 1:25,000 Ordnance Survey (OS) mapping;
- British Geological Survey, 2013. Geoindex Onshore 1:50 000 geological map;
- British Geological Survey, Hydrogeological map of Scotland;
- Historic Environment Scotland, Scottish Natural Heritage, Sustrans and Forestry Commission databases;
- The technical specification for single circuit 33 kV OHL on wood poles: SPEN Technical Specification OHL-03-099.

The following field surveys were undertaken:

- Extended Phase 1 habitat survey of the initial proposed OHL route (Figure 2.1), including a 500 m buffer area; and

² SP Energy Networks (May 2015) *Major Electrical Infrastructure Projects: Approach to Routeing and Environmental Impact Assessment*, available here: http://www.spenergynetworks.co.uk/userfiles/file/SPEN_Approach_to_Routeing_FINAL_20150527.pdf

- Cultural Heritage walkover survey the initial proposed OHL (Figure 2.1), including a 100 m buffer area.

2.3 Consideration of Alternatives

A number of alternative route alignment options were considered during the process described above. These are shown on Figure 2.1, which shows the initial route identified by SP Energy Networks and the alternative route alignment options identified.

SP Energy Networks' policy is to base the initial route selection on the assumption that a new connection would be made using OHL. This is in order to meet obligations under the *Electricity Act 1989* to provide an economic solution. An underground cable would only be considered where all OHL options had been considered and discounted. Underground cable is typically only used by SP Energy Networks in cases where there is a specific environmental constraint or technical need, which outweighs the additional costs associated with the cable installation and the additional challenges associated with maintenance of a cable.

In this case, a single wood pole OHL is considered to be suitable for the majority of the route, from the consented Tralorg wind farm to the end of local road off B734 at Pinmore Mains. Due to economic factors as well as technical difficulties, including but not limited to crossing the minor road and Muck Water and crossing the existing 275 kV OHL on the approach to Mark Hill substation, it is proposed that the final section of the line be placed underground (Figure 2.2).

2.4 Route Selection Outcome

As described above, the proposed development will consist of a combination of OHL, supported on single and H wood poles, and underground cable. The proposed alignment is considered to provide the optimum balance of technical, economic and environmental factors.

Key influencing factors in choosing the alignment for the new wood pole OHL sections were:

- to minimise visual impact on residential properties and from the public road network;
- to minimise the need for woodland removal, as far as possible; and
- to make use of existing access tracks as much as possible.

Further assessments of the proposed development are considered in Chapters 5 to 9.

3. PROPOSED DEVELOPMENT

3.1 Introduction

This chapter describes the characteristics of the proposed development, including the proposed alignment for the OHL and underground cable and the nature of proposed construction works. More detailed descriptions of the baseline environment associated with the proposed alignment are described in Chapters 5-9 of this report. The proposed alignment, including indicative wood pole locations, is shown on Figure 3.1. The alignment is split into two sections; the northern OHL section and the southern underground cable section, as shown on Figures 3.1a-3.1d.

Technical drawings showing how various items of infrastructure will be constructed are provided in Figures 3.2 to - 3.5.

3.2 Limits of Deviation

The maximum horizontal Limits of Deviation (LoD) of 25 m either side of the proposed OHL alignment and underground cable has been set to allow for micrositing of the wood pole locations, in order to avoid environmental or physical features as required (Figure 3.1).

The maximum vertical LoD is 18 m, whereby the typical pole height is likely to be between 9.5 m and 15 m above the ground level (including steel work and insulators), but poles may vary in height in order to respond to local topographical variations, engineering and safety considerations. Detailed site investigation may determine that there is a need for periodic terminal poles, which are double poles. The assessments carried out for this appraisal have assumed that the wood poles could be placed anywhere within the OHL LOD, with a typical pole height of 11 m (9.5 to 15 m range).

3.3 Summary of Alignment

The northern part of the proposed development begins at the consented Tralorg wind farm substation (at NGR NX22753 96868) from where it would run southwards to Tormitchell Quarry (NGR NX23159 94487), crossing the minor road to the east of High Troweir. It would then turn south-west towards Pinmore, running parallel with the minor road and the Water of Assel. To the east of Pinmore, it would turn southwards crossing the River Stinchar at NGR NX21535 90851 and continuing south-east parallel to an existing track. A terminal pole would be located at the end of the existing track off the B734 at Pinmore Mains.

The connection would be completed by underground cable from this point to the Mark Hill substation. The cable would follow an existing track and footpath south of Pinmore Mains along the edge of Glentool Forest. The cable would then cross Muck Water (NGR NX23995 87373) and the existing 275 kV OHL and continue southwards before connecting into the Mark Hill substation.

The overall length of the proposed development is ~14.6 km, comprising 9.4 km of OHL and ~5.2 km of underground cable.

3.4 Description of Development

3.4.1 Description of OHL

The proposed OHL would be constructed using 119 wood pole structures, in a combination of single and terminal wood pole structures. Each pole is topped by galvanised steelwork cross-arm and insulators (likely to be grey plastic). The steel cross arm and insulators would carry a single three-phase circuit (three metal alloy conductors) in a flat formation (i.e. all at the same height). A typical wood pole is illustrated in Photo 3.1.



Photo 3.1. Typical wood pole for Proposed Development

The wood poles would be seasoned and treated with a suitable preservative, resulting in a dark brown appearance, which would weather to a silver/grey colour over a period of approximately five years following installation.

The height of the wood poles would typically be 11 m above the ground level (including steel work and insulators). Pole heights may be increased locally where required to safely cross features such as watercourses. The statutory ground level clearance required for a 33 kV OHL is 5.2 m, as per SPEN Technical Specification OHL-14-005.

The spacing between the poles would vary depending on topography, altitude and land usage. The distance between the poles will be determined later in the design process; an average span of 80 m is estimated; however, the spans could range from 60 m to 110 m to accommodate technical and environmental considerations. Stays (guy lines) will be provided for additional stability for poles on changes in direction.

3.4.2 Description of Underground Cabling

The proposed underground cable sections would comprise three 33 kV cables installed in a trench in a trefoil duct formation, as illustrated in Figure 3.2. A duct for fibre optic cabling has been included as part of the proposed cable arrangement.

The trench would be excavated to the contour of the original ground so that the duct is laid to a minimum depth of 0.9 m (max depth, 1.6 m) below ground level accommodating any bedding materials.

Joint bays would be required to join cable lengths, with approximately 490 m between joint bays. Final joint bay positions would be established as part of the pre-construction detailed design work. An illustration of a typical joint bay is provided in Figure 3.3.

3.5 Construction Methods

The construction methods and proposed environmental management measures are briefly described below for the purposes of informing this environmental appraisal. A construction phase Environmental Management Plan (EMP) would be developed by the appointed contractor at the pre-construction stage.

3.5.1 Site Establishment and Temporary Construction Compounds

Construction access would be from the A714 road and would use minor roads. Access routes are shown on Figure 3.4. Existing estate access tracks and gates would be used for access to work locations.

Temporary construction access tracks would be required in the south between Muck Water and Mark Hill substation. The track would be a 3 m wide floating stone track, running adjacent to the underground cable route. The track would be removed following energisation of the connection, or before, and the ground reinstated.

Up to three temporary construction compounds would be required, with the preferred site for the main compound located in proximity to Markhill substation and other locations still to be determined. The main construction compound would comprise site offices, welfare facilities, parking and limited materials storage. The contractor would obtain all the necessary consents and permits once the precise location of all temporary construction compounds is decided upon. The compounds would have workforce welfare facilities with material storage and handling areas. A typical yard compound layout is provided in Figure 3.5.

Site compounds and storage areas will be kept to the minimum necessary for safe implementation of the works. On-site storage of oil and fuels will be avoided if possible but where on-site storage is required, the volumes to be stored would be minimised and stored in accordance with all applicable legislation and good practice.

Clearly defined areas for the storage of oil will be identified as part of the site establishment process. Spill kits would be located and maintained at all oil storage and refuelling locations and on all site vehicles. An emergency response procedure would be provided as part of the proposed EMP.

All waste would be stored securely and disposed of through a licensed waste carrier, in accordance with waste regulations and the Site Waste Management Plan.

3.5.2 Forestry

Some felling of commercial plantation woodland would be required to construct the proposed development. The total area of felling would be approximately 3.83 ha. SP Energy Networks would liaise with the landowners to agree a suitable felling strategy. It is anticipated that all timber would be extracted from the site and transported to an end user (sawmill, board/pulp mill or wood fuel processing depot).

Further details of anticipated forestry removal are presented in Chapter 9: Forestry.

Felling would be completed using a mechanical harvester, with timber extracted using an industry standard six or eight wheeled forwarder with telescopic boom and hydraulic grapple. Where, either due to tree size or location, it is not viable to use a mechanical harvester, manual chainsaw operators would complete the felling work.

3.5.3 OHL Construction

The following process would be followed for wood pole erection³:

- A typical resilience corridor of up to 30 m for OHL (15 m either side of the alignment) to ensure the electric line is resilient to disruption;
- Access, delivery and assembling would be taken using a tracked excavator and low ground-pressure vehicles (e.g. tractor, argocat, quad bikes), helicopter may also be used for delivery of wood poles;
- Bog mats and temporary track mats would be used where required to cross soft ground where existing access tracks are not available and low ground pressure vehicles would not suffice;
- Turf and topsoil would be removed together to retain the turf root system and placed to one side for later reinstatement;
- A hole would be excavated to allow the pole brace block and/ or steel foundation braces to be positioned in place. A typical pole excavation is 3 m² x 2 m deep;
- The excavated material is then sorted into appropriate layers and used for backfilling;
- The poles are erected using normal agricultural machinery such as a digger with a lifting arm;
- The excavator(s) then hoists the assembled structure into position and, once the structure has been braced in position, the trench is backfilled;
- The hole would be backfilled with soil replaced in reverse order to the order of excavation;
- Backfilling would be progressed in layers of approximately 300 – 400 mm deep, with stone hardcore added as required around foundation blocks to ensure adequate compaction and suitable geotechnical conditions are maintained between each layer; and
- When replacing the topsoil/turf around the pole it would be left slightly proud of ground level (approximately 150/ 300 mm) to allow for the excavation to naturally compact further through time.

It is anticipated that all material excavated for the installation of the poles and stays would be used in backfilling the excavations.

Watercourse Crossings

The OHL construction would not require the construction of any new watercourse crossings, other than for the Stinchar. This watercourse crossing would not require any in-channel works. Access would use existing tracks and watercourse crossings as far as possible. Where required, temporary track mats and bog mats would be used to cross areas of soft ground. Bog mats would be used to cross minor watercourses without damage to bank integrity.

Where pole installation is required within 30 m of a watercourse, silt traps or other mitigation would be put in place (which would be outlined in the EMP), with nearby watercourses checked during periods of high rainfall during construction activities. Ground excavation work would temporarily stop work during periods of high rainfall, where a risk to surface water quality is identified.

3.5.4 Cabling Procedure

Excavation

A typical working corridor of a width to be agreed with relevant landowners would be required during construction of the underground cabling sections of the proposed development.

³ For more details see SPEN document DOC-00-313 (Distribution Wood Pole Overhead Line Virtual Manual).

The trench would be excavated to a minimum depth of 0.9 m (max depth, 1.6 m) using a tracked excavator. The trench bottom would be uniform with adequate clearance on each side of the ducts and be free from roots, organic debris, clods, rocks, stones, and other materials likely to cause damage to the cable duct.

Trench walls would be supported appropriately where necessary to ensure trench stability. Excavations would be kept free from water by use of mobile pumps, with water pumped to a suitable settlement pond, prior to either infiltration (to ground) or discharge (via piping). Drainage design measures to ensure the discharge would not result in pollution to surface water would be set out in the EMP.

All excavated material would be carefully stored a minimum of 10 m away from any adjacent watercourse with particular care taken to prevent any risk of runoff or wind borne dry sediment into the watercourses.

Cement Bound Sand (CBS) backfill will be placed surrounding the cable ducts in appropriate layers. A 75 mm minimum bedding layer of stabilised backfill will be laid in the trench bed to provide a bedding for the ducts. Marker boards will then be placed on top of the CBS. Excavated material would then be placed on top of the marker board and compacted in place. Backfill would be completed by returning the remaining excavated material to the trench in layers, in reverse order with the existing vegetation placed on the trench where possible.

Watercourse Crossings

All underground cable watercourse crossings would require authorisation under *The Water Environmental (Controlled Activities) (Scotland) Regulations 2011 (CAR)*. Open-cutting with a flume crossing would generally be used for minor watercourses– dependant on the depth and water volumes involved. This will apply to all minor watercourse crossings for the underground cable, as well as any temporary stone tracks that are required for construction of the underground cable. In order to cross the Muck Water, an open-cut with a flume crossing would also be used.

Good practice pollution prevention and control measures would be implemented at all watercourse crossing work sites.

3.5.5 Working Hours

Working hours would be based on a 7 day week. These are:

- April – September: 7 days 07.00 – 19.00; and
- October – March: 7 days 07.30 – 17.00.

4. CONSULTATION

4.1 Introduction

SPEN is committed to public and stakeholder consultation to gather opinion and advice on the proposed alignment and any site-specific sensitivities. This chapter describes the consultation undertaken and summarises comments arising from it and how these have been dealt with.

4.2 EIA Screening

The screening opinion identified the following key issues raised by statutory consultees.

Table 4.1: Summary of Consultee Responses		
Stakeholder	Issue Raised	Response / Action Taken
South Ayrshire Council	It is noted that, within the designated scenic areas of South Ayrshire and these landscape character areas (Foothills and Intimate Pastoral Valleys, Plateau Moorlands) which the proposed line passes through, landscape and planning guidance for the area seeks to encourage underground cable solutions in preference to pylon lines for all or part of the route. This practice has been adopted for the major wind farms in this area.	Chapter 5: Landscape and Visual Appraisal provides an appraisal of potential landscape and visual impacts and how such impacts have been mitigated through design.
Scottish Natural Heritage	There are no nationally or internationally designated sites within or adjacent to the proposed OHL. In addition, there are no national landscape designations that are likely to be affected by this proposal. As a consequence, it is our view that this proposal is unlikely to have significant effects on national designations relevant to our interests. However, we consider that the following key issues should be addressed: a) Ecological impacts, including direct and indirect impacts upon habitats (particularly peatland) and protected species; b) Landscape (particularly with regards to the South Ayrshire Scenic Area) and recreational impacts; c) The cumulative impacts of a) and b) in combination with other development proposals in the area.	Ecological impacts are considered in Chapter 7: Ecology and Ornithology Appraisal. Landscape and visual impacts, including potential impacts on recreational resources, are considered in Chapter 5: Landscape and Visual Appraisal. Cumulative impacts alongside other proposed developments in the area are considered within each of these technical chapters.

<p>Scottish Environment Protection Agency</p>	<p>To meet the objectives of the Water Framework Directive, developments should be designed wherever possible to avoid engineering activities in the water environment. Where engineering activities are proposed in the vicinity of a watercourse, for example, any crossings of streams, including by vehicles, these activities should be undertaken in accordance with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR).</p> <p>We therefore recommend that the consideration is given to micrositing the proposed pole locations away from the vicinity watercourses (at least 10m back from the top of watercourse banks) to minimise the potential impact/disturbance on the banks and bed of watercourses and minimise the risk of pollution. Buffer strips to watercourses should also be adopted to protect the riparian zone.</p> <p>We recommend that the developer contacts our regulatory services team (contact details in Section 5.1) at the earliest possible opportunity to discuss how it is proposed to cross the various watercourses (particularly the underground crossing of the Muck Water) and our requirements for the site under CAR.</p>	<p>Potential impacts on hydrology are considered in Chapter 8: Hydrology and Hydrogeology Appraisal, which includes a watercourse crossing assessment (Technical Appendix 8.1).</p>
	<p>One of our key interests in relation to major developments is pollution prevention measures during the periods of construction, operation and restoration. We therefore welcome the intention to prepare a Construction Environmental Management Plan (CEMP) informed by an Environmental Appraisal.</p>	<p>Pollution prevention measures, including outline content of the proposed EMP, are detailed in Chapter 8: Hydrology and Hydrogeology Appraisal</p>
	<p>Another key issue for us is the timing of works. Therefore, we recommend that a Schedule of Mitigation be prepared including a timetable of works that takes into account all environmental sensitivities which may also be raised by SEPA, SNH or other stakeholders. Timing should also be planned to avoid potentially polluting activities during periods of high rainfall.</p>	<p>A Schedule of Mitigation is contained in Chapter 10: Summary, which includes recommendations regarding timing of works.</p>
	<p>Any waste materials imported to the site during construction must be stored and used only in accordance with a waste management licence or exemption under the Waste Management Licensing (Scotland) Regulations 2011. Similarly, any waste materials removed from the site must be disposed of at a suitably licensed or exempt waste management facility in accordance with these Regulations.</p>	<p>Provisions for transportation and storage of waste materials are detailed in Chapter 8: Hydrology and Hydrogeology Appraisal.</p>
	<p>It is a requirement of CAR to provide a SUDS system throughout the construction phase of the development to ensure adequate protection of the water environment. The system should</p>	<p>Details of the proposed drainage/SUDS measures are contained in Chapter 8:</p>

Table 4.1: Summary of Consultee Responses		
	<p>comply with the Rules detailed in GBR's 10 & 11. Suitable pollution control measures should be employed wherever there is an identifiable risk to the water environment. This must give particular consideration to contaminated surface water run-off arising from earthworks, roads, drainage, compounds, concrete.</p>	<p>Hydrology and Hydrogeology Appraisal.</p>
	<p>The disposal of any forestry material generated during the works must be managed in accordance with guidance on the Management of Forestry Waste and Use of Trees Cleared to Facilitate Development on Afforested Land. Any reuse of felling waste material must in line with this guidance.</p>	<p>Details of proposed forestry felling and re-stocking are contained in Chapter 9: Forestry Appraisal. SP Energy Networks is engaged in ongoing discussions with landowners, including the Forestry Commission, and a Forestry Management Plan will be prepared as part of the detailed design.</p>

5. LANDSCAPE AND VISUAL APPRAISAL

5.1 Introduction

This chapter presents an appraisal of predicted landscape and visual impacts as a result of the proposed 33 kV wood pole OHL and cable route connection between Tralorg Wind Farm and a substation at Mark Hill, north of Barrhill in South Ayrshire (see Figure 5.1). The aim of the Landscape and Visual Appraisal (LVA) is to assess the potential impacts of the proposed development on the landscape and visual resource of the site and surrounding area.

The assessment has been carried out by Ramboll's team of Chartered Landscape Architects and is accompanied by the following figures:

- Figure 5.1: Site Location and Study Area with Zone of Theoretical Visibility (ZTV);
- Figure 5.2a: SNH Landscape Character Types within the Study Area;
- Figure 5.2b: South Ayrshire Council Landscape Character Types within the Study Area;
- Figure 5.3: Landscape Designations within the Study Area;
- Figure 5.4: Viewpoint Locations; and
- Figures 5.5 – 5.10: Viewpoint Baseline Photographs and Visualisations.

5.2 Scope of Assessment

The LVA considers impacts on:

- Landscape fabric, caused by changes to the physical form and constituents of the landscape;
- Landscape character, caused by changes to key characteristics and qualities of the landscape; and
- Visual amenity, caused by changes to the visual composition of views and the wider visual resource.

The LVA also considers cumulative impacts attributable to the proposed development when considered in conjunction with consented, operational and proposed developments of a similar type.

The LVA was based on a single wood pole overhead line carrying 3 conductors, assuming a typical pole height of 11 m (including insulators). In addition, the assessors have taken into account that the maximum vertical LOD is 18 m above ground level, and poles will vary in height up to this maximum height in certain locations in order to accommodate topographic variation. The proposed development is described in Chapter 3: Proposed Development.

The scope of the assessment has been influenced by a combination of:

- Consultation with South Ayrshire Council;
- Planning policy and formal published guidance; and
- Preliminary and revised visual analysis.

5.2.1 Consultation

Consultation was undertaken with South Ayrshire Council to agree the locations of a series of representative viewpoints (VPs) and on the methodology to be used for the appraisal.

South Ayrshire Council confirmed their approval of preliminary VPs proposed by the applicant but requested a further VP location was added to represent views from the Stranraer to Kilmarnock railway line. This has been included as Viewpoint 5 (see Table 5.1).

5.2.2 Preliminary Visual Analysis

A preliminary visual analysis was carried out to identify landscape and visual receptors which are predicted to have theoretical visibility of the proposed development based on the size, scale and alignment of the proposed development, based on the Zone of Theoretical Visibility (ZTV) presented in Figure 5.1.

5.3 Assessment Methodology

The purpose of the LVA is to identify, predict and evaluate potential impacts associated with the proposed development. Wherever possible, identified impacts are quantified, however the nature of LVA requires interpretation by professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude of impact and assessment of the residual landscape and visual impacts have been based on pre-defined criteria.

5.3.1 Guidelines

The LVA accords with guidance provided in:

- Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidance for Landscape and Visual Impact Assessment – Third Edition (GLVIA3);
- The Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment;
- Scottish Natural Heritage and the Countryside Agency (2002) Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity; and
- Advice Note 01/2011: Photography and Photomontage in Landscape and Visual Assessment (the Landscape Institute, 2011).

5.3.2 Data

The LVA was informed by data gathered from the following sources:

- OS Terrain 50;
- Ordnance Survey mapping (1:25,000; 1:50,000);
- Carol Anderson Landscape Associates. (July 2013) South Ayrshire Landscape Wind Energy Capacity Study: Appendix Report¹. [South Ayrshire Council](#);
- Land Use Consultants (1998). Ayrshire Landscape Assessment. [Scottish Natural Heritage Review](#). No 111;
- Field surveys in 2018;
- Commercially available aerial photography;
- Computer generated theoretical ZTV;
- Site photography; and
- Consultations with South Ayrshire Council.

5.3.3 Measurements

Receptor distances from the proposed development are calculated on the basis of the nearest pole location. Where measurements are given between landscape character types, designated areas, routes or settlements, such measurements relate to the nearest part of such areas and routes to the proposed development.

¹ This report has been used insofar as the baseline description of the landscape, including the classification of landscape character types.

5.3.4 Study Area

Defining the study area takes into account the nature of the topography, the pattern of visibility shown by the ZTV, the presence of existing vegetation and the pattern of settlement and other visual receptors such as residents, workers and those engaging in recreation in the area surrounding the proposed development.

For this appraisal, the study area extends to 2 km from the proposed development (see Figure 5.1). The appraisal only focuses on those areas which have ZTV coverage.

5.3.5 Assumptions and Limitations to the Assessment

This appraisal has assumed that the woodland and shelterbelts / roadside vegetation located in the study area would be retained. Any coniferous plantation woodland is anticipated to be on rotational felling cycle (unless otherwise known), and this is taken into consideration in the appraisal.

Access to private properties was not requested as part of the visual assessment of impacts. It is acknowledged the proposed development will be viewed from residential properties located within the study area. Representative views from nearest communities (such as Pinmore) and in areas where scattered residential properties are located have been taken to assess the impact of the change in view for residential receptors in respect of 'community amenity'. The LVA does not include an assessment of impact on private views from individual properties.

5.3.6 Assessment Process

Baseline

Prior to site work being undertaken, a baseline study was carried out to gain an understanding of the character of the landscape in the immediate and wider area of the proposed development site, identify any areas designated for their landscape and scenic qualities, and to identify key visual receptors most likely to be affected by the proposed development.

The assessment of baseline conditions was undertaken with reference to existing landscape character assessment studies extant within the study area. These studies have been considered and verified on site, and for the purposes of the LVA of the proposed development, the findings have been adopted as defining the baseline landscape character.

The LVA also considers landscape and visual impacts on designated landscapes in the study area, as well as non-designated sensitive landscapes such as Gardens and Designed Landscapes (GDLs) or areas of Wild Land.

The receptors of visual amenity include the publicly accessible areas including outdoor recreational areas, settlements, roads and the public rights of way.

Visibility Mapping

To assist in evaluating potential landscape and visual impacts arising from the proposed development, ZTVs were generated to identify the potential extent of the proposed development's visibility over the study area.

The ZTV presents the area from which the proposed development may be visible. The ZTV is produced by computer modelling using ArcMap GIS software, and a 50 m digital terrain model (DTM) and was modelled based on the anticipated pole locations. Poles were modelled to reflect the varying heights of each pole.

The resulting ZTV is shown on Figure 5.1, overlaid on OS 1: 50,000 mapping to provide an indication of where the proposed development would theoretically be seen from, and which receptors would therefore be affected by views of the works. It should be noted, that the ZTV

findings are based on a bare ground terrain model which does not take account of the screening impact of vegetation or built development, nor does it include localised topographical variations or features in topography. This is considered important in respect of the LVA as the area in which the proposed development would be located has a high degree of forestry, tree cover, hedges and riparian vegetation, which serve to restrict intervisibility and potential views of the proposed development. Consequently, visibility would be considerably less than indicated in the ZTV.

Given the inherent limitations of the ZTV, it has only used as a tool to inform the understanding of the general pattern of visibility of the proposed development. Site work was utilised to verify the findings of the ZTV, thereby gaining an understanding of where screening may be afforded, and where discrepancies are found, these are described in the text. Site work has therefore allowed the assessors an understanding of where the proposed development would be visible from.

Site Survey and Fieldwork

Field surveys and site photography were undertaken in April 2018 to identify specific landscape constraints, visual receptors and to verify / supplement data collected in the desk-based baseline appraisal.

All fieldwork was undertaken in early spring however deciduous trees and hedgerows were not yet in leaf and therefore screening was at its least effective, providing the assessors with a worst-case scenario of the impact anticipated from the proposed development.

Landscape and Landscape Receptors

Landscape receptors include the different landscape character types or areas which may be affected by the proposed development, as well as landscape designations or classifications within the study area.

The ZTV indicates those areas of the landscape which have the potential to be affected (directly or indirectly) by the proposed development. Landscape receptors considered in this appraisal include:

- The landscape of the site;
- Landscape Character Types (LCTs) as they lie within the study area; and
- The South Ayrshire Scenic Area (designated landscape).

Viewpoints and Visual Receptors

Only those receptors with potential for visibility (as indicated by the ZTV) have been considered for inclusion in the visual impact appraisal. Baseline research and field work confirmed the actual visibility of the proposed development and identified those receptors who were likely to be affected by views of the proposed development. These receptors are:

- The settlement of Pinmore;
- Users of the Girvan to Barr public right of way;
- Users of the A714, the B734 and the unclassified local road which runs along the Water of Assel valley; and
- Passengers travelling along the Stranraer to Kilmarnock railway line.

The assessment of these receptors was agreed in consultation with South Ayrshire Council.

The visual appraisal is illustrated from six VPs which have been selected to present typical views from within the study area, illustrating the impacts on viewers from different directions and at different distances. These VPs are listed and described in Table 5.1 and shown on Figure 5.4,

and, are all publicly accessible. The purpose of the viewpoint appraisal is to ascertain the level of visual impact at specific locations and to help to inform the appraisal of the overall impact of the proposed development on visual amenity.

VP locations were discussed and agreed with South Ayrshire Council prior to fieldwork taking place. In some instances, VPs have been slightly relocated from those presented to South Ayrshire Council. This has been required due to site work identifying that some of the agreed VPs would not have actual views of the proposed development, or as a result of health and safety concerns restricting access. Alternative VPs in proximity to those presented to SAC have been sought to reflect the reason for selection of the original agreed VP location (i.e. proximity to identified receptor, representation of landscape character). It is considered that the viewpoints presented in Table 5.1 provide a representative spread of the locations where views of the proposed development are available for sensitive receptors.

Table 5.1: Viewpoint Locations		
VP Ref	Name Approximate Coordinates and Distance to Proposed Development	Description and Reason for Selection
VP01	Dinvin road at High Trowier Farm 222767, 595787 40 m west	Indicative of views from the local road near residential properties, at the northern end of the valley through which the line runs. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Assel Water Valley. Located within the transitional landscape between the Coastal Foothills Landscape Character Type (LCT) and the Foothills with Forest and Wind Farms LCT.
VP02	Girvan – Barr Path at Dinvin Road 222846, 594161 120 m south east	Local recreational receptor. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Assel Water Valley. Located within the transitional landscape between the Coastal Foothills Landscape Character Type (LCT) and the Foothills with Forest and Wind Farms LCT.
VP03	Dinvin Road at the Assel Valley Wind Farm access 221323, 593550 340 m south east	Representative of views from the local road, from residential properties and of the Water of Assel valley landscape. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Assel Water Valley. Located within the transitional landscape between the Coastal Foothills Landscape Character Type (LCT) and the Foothills with Forest and Wind Farms LCT.
VP04	Pinmore 220353, 592035 790 m east	Nearest settlement to the alignment of the proposed development. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Assel Water Valley.

		Located within the transitional landscape between the Coastal Foothills Landscape Character Type (LCT) and the Foothills with Forest and Wind Farms LCT.
VP05	A714 Layby 219882, 592952 1.3 km south east	A representative viewpoint from an elevated position within the study area, providing panoramic views from the A714 and from the Stranraer to Kilmarnock railway line. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Assel Water Valley. Located within the transitional landscape between the Coastal Foothills Landscape Character Type (LCT) and the Foothills with Forest and Wind Farms LCT.
VP06	Balligmorrie 222309, 590474 640 m west	B-road receptor, linking the Pinmore area with Barr. Indicative of views from within the South Ayrshire Scenic Area as the designation extends across the Stinchar Valley. Located within the transitional landscape between the Coastal Foothills Landscape Character Type (LCT) and the Foothills with Forest and Wind Farms LCT

Mitigation

Mitigation measures which have been developed to reduce, remedy or avoid the impacts arising as a result of the proposed development are presented in Tables 5.5 and 5.6 of this chapter.

Residual Effects

As identified in GLVIA3, effects are identified by establishing and describing the changes to the landscape and visual baseline resulting from the proposed development and the resulting effects on individual landscape or visual receptors. The assessment of effects is derived from a comparison of the sensitivity of receptors and the magnitude of impact anticipated as a result of the construction and operation of the proposed development, as indicated in Table 5.2 below.

There is no requirement for a formal EIA to support this application. The appraisal has used the guidance provided by GLVIA3 Statement of Clarification 1/13 on the terminology to be used in non-EIA Landscape and Visual Appraisals:

"In carrying out appraisals, the same principles and process as LVIA may be applied but, in so doing, it is not required to establish whether the effects arising are or are not significant given that the exercise is not being undertaken for EIA purposes. The reason is that should a landscape professional apply LVIA principles and processes in carrying out an appraisal and then go on to determine that certain effects would be likely be significant, given the term 'significant' is enshrined in EIA Regulations, such a judgement could trigger the requirement for a formal EIA.

The emphasis on likely 'significant effects' in formal LVIA stresses the need for an approach that is proportional to the scale of the project that is being assessed and the nature of its likely effects. The same principle – focussing on a proportional approach –

also applies to appraisals of landscape and visual impacts outside the formal requirements of EIA.”

In line with current guidance contained within GLVIA3, the terms ‘significant’ and ‘not significant’ have not been used in this appraisal. The level of impact is assessed through a combination of two considerations – the sensitivity of the receptor (landscape or visual), and the magnitude of impact arising from the development of the proposals, as described above. The levels of impact have been set using the terms none, negligible, minor, moderate, or major in order to quantify the findings of the assessment. There is a gradual, indistinct transition between levels, and the given grade is based on many variables, weighed up by the application of professional judgement and experience, on a case by case basis. Each assessment varies depending on the location, the landscape and visual context and the type of development proposed.

Magnitude of Impact	Sensitivity of Receptor to Impact			
		High	Medium	Low
High		Major	Major/ Moderate	Moderate
Medium		Major/ Moderate	Moderate	Minor
Low		Moderate	Minor	Minor/ Negligible
Negligible		Minor	Minor/ Negligible	Negligible
None		None	None	None

Illustrative tools

In addition to the ZTV, figures have been produced to show the location of landscape designations, landscape character areas, recreational routes and VP locations within the study area (see Figure 5.1 – 5.4).

Photomontages have been prepared for each VP by combining a wireline of the view of the proposed development with the photograph of the existing view and rendering the image using a model of the proposed development (see Figures 5.5 – 5.10).

It should be noted that, whilst photography is a valuable tool to assist in the visualisation process, it cannot be expected to replicate the actual view or predicted view which would be attained on the ground.

5.3.7 Undertaking the Assessment

Nature of Impacts

Impacts can be adverse (resulting in the loss or erosion of key characteristics of the landscape and/or view) or beneficial (resulting in an enhancement or improvement to the baseline condition of the landscape and/or view). For the purposes of this assessment impacts are assumed to be adverse unless stated otherwise. It is important to note that impacts can impact on both the degree and nature of impacts during the course of development, and with the maturation of some mitigation measures (e.g. tree/shrub planting which would gradually screen development and strengthen the character, structure and condition of the landscape, offering beneficial outcomes).

The assessment of residual impacts is set out in Section 5.5 of the LVA. Proposed mitigation measures aimed at impact avoidance, reduction of impacts and/or replication of landscape and visual characteristic elements are outlined in Section 5.4.

Landscape Sensitivity

The sensitivity of landscape receptors to impact arising from the type of development proposed is defined as high, medium and low and is based on professional interpretation of their value and susceptibility to the type of development proposed.

The value attached to landscape receptors (landscape character) is reflected by landscape designations and the level of importance which they signify. However, landscape designations are not the sole indicator of landscape value. The following factors are also important considerations in ascribing value:

- Landscape quality;
- Scenic quality;
- Rarity;
- Representativeness;
- Conservation interest;
- Recreation value;
- Perceptual aspects; and
- Cultural associations.

Susceptibility to impact concerns the ability of the landscape receptor to accommodate the proposed development without undue negative consequences for the maintenance of the baseline situation and/or the landscape planning policies and strategies.

The susceptibility of landscape character to impact is defined as high, medium or low based on an interpretation of a combination of parameters including:

- The scale and pattern of the landscape and its elements/features;
- The simplicity or complexity of the landscape;
- The nature of skylines;
- Landscape quality or condition;
- Existing land use;
- Visual enclosure/openness of views; and
- The scope for mitigation, which would be in character with the existing landscape.

Sensitivity of Visual Receptors

The sensitivity of visual receptors is defined as high, medium and low based on professional interpretation, combining judgements of their susceptibility to the type of impact or development proposed and the value attached to the particular views. Visual receptors are assessed in terms of both their susceptibility to impact in views and visual amenity and also the value attached to particular views.

The susceptibility of different visual receptors to impact in views and visual amenity is mainly a function of:

- The occupation or activity of people experiencing the view at particular locations; and
- The extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience (and expect) at that particular location.

In relation to the occupation or activity of people experiencing the view at the viewpoint, visual susceptibility is defined as follows:

- High: Residents of dwellings; users of outdoor recreational facilities including strategic recreational footpaths, cycle routes or rights of way, whose attention is focused on the landscape; visitors to cultural/historic assets where views out from the location are key to the enjoyment and experience of the asset, important landscape features with physical, cultural or historic attributes; beauty spots or picnic areas. Travellers on key tourist routes where vehicles are likely to contain passengers who have a particular interest in views of the landscape.
- Medium: General road users, commuters and travellers not primarily focused on the landscape.
- Low: People engaged in outdoor sports or recreation (other than appreciation of the landscape), commercial buildings, and other locations where people's attention may be focused on their work or activity, rather than their surroundings.

5.3.8 Magnitude of Impact

Each of the landscape and visual impacts identified are evaluated in terms of their size or scale, the geographical extent of the area influenced, and their duration and reversibility.

The magnitude of impact arising from the proposed development in respect of landscape character is described as High, Medium, Low, Negligible or None based on the interpretation of a combination of largely quantifiable parameters, as follows:

- The distance of the receptor from the proposed development;
- The extent of existing landscape elements that will be altered/lost;
- Adding of new ones;
- The proportion of the total extent of the landscape elements that this represents;
- The degree to which aesthetic or perceptual aspects of the landscape would be altered by removal of existing components or with the addition of new elements;
- The context in which the proposed development would be seen (i.e. similar land uses in the vicinity of the development);
- The geographic area over which the loss of landscape elements will be perceived;
- The alteration of the skyline/altering the vertical scale in relation to the existing landscape features;
- The duration of the impact; and
- The reversibility of the impact.

The criteria utilised in ascribing magnitude of impact in respect of visual amenity is as follows:

- The scale of impact in the view with respect to the loss or addition of features in the view and impacts in its composition, including the proportion of the view occupied by the proposed development;
- The degree of contrast or integration of any new features or impacts in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and textures;
- The nature of the view of the proposed development;
- The relative amount of time over which it will be experienced and whether views will be full, partial or glimpsed;
- The angle of view in relation to the main activity of the receptor;
- The distance of the viewpoint from the proposed development; and
- The extent of the area over which the impacts would be visible.

The magnitude of impacts are categorised as follows:

- High: Total loss or considerable alteration to key elements, features or characteristics of the landscape character and/or composition of views. The development is highly prominent or even dominant and could become the defining characteristic of views and landscape character.
- Medium: Represents a notable alteration or loss of key elements, features or characteristics of the landscape character and/or composition of views. The development is prominent, but not dominant. In such circumstances the development may become 'a' defining characteristic of the view of landscape, but not 'the' defining characteristic.
- Low: Constitutes a partial loss to one or more key characteristics of the landscape or views. Localised impacts within an otherwise unaltered landscape or visual context.
- Negligible: Represents a barely discernible loss or alteration to one or more key elements, features or characteristics of the baseline conditions. The underlying landscape character or view composition would be essentially unimpacted.
- None: no discernible impact apparent.

5.3.9 Cumulative Impacts

The purpose of the cumulative impacts assessment is to establish the cumulative impact of the proposed development when considered in conjunction with similar existing consented or proposed² developments within the study area.

A search for other proposed developments of a similar size, scale and/or character to the proposed development was undertaken using the Council's online planning application search tool. No such developments were identified within the study area.

The proposed Stranoch Wind Farm grid connection, a 132 kV OHL, runs approximately 20 km southwards from Mark Hill substation to the Stranoch Wind Farm site, and is located approximately 4 km from the closest pole of the proposed development³. This is the nearest development of this nature to the proposed development and therefore has been considered for its potential to result in cumulative impacts in relation to the proposed development. No final alignment or pole locations have been agreed for this development at the time of this assessment, and therefore the route corridor presented at the public consultation events held in March and April 2017.

The Stranoch Wind Farm grid connection corridor routes south from the Mark Hill substation, dropping into the Duisk Valley north east of Barrhill and then climbing out of the valley into the broad landscape of the plateau moorlands where it would pass through an area of forestry; between the Arecleoch and Chirmorie Wind Farms and then south to Stranoch Wind Farm.

The plateau moorland landscape in this area is a wind farm landscape, as wind turbines are a dominant characteristic of the landscape above the Duisk Valley. Within the Duisk Valley, broadleaved and plantation woodland is prolific, and it is anticipated that this vegetation would reduce the influence of the proposed grid connection on the character of the landscape. A number of electricity lines and transmission lines pass across the landscape in this area.

From the A714 as it runs along the Duisk Valley, views are contained by roadside vegetation and topography, with little opportunity for wider views across the landscape. Barrhill is the closest settlement to the proposed Stranoch grid connection development.

Site work has identified that, due to the levels of woodland, plantation forestry and existing infrastructure within the landscape surrounding both developments, combined with the increased

² i.e. subject to a registered planning application.

³ The cabled section of the proposed development is not considered in the cumulative assessment.

distance and nature of topography no cumulative impacts would be experienced. Therefore, a detailed cumulative assessment has not been undertaken for the proposed development in combination with the Stranoch Wind Farm grid connection.

Impacts arising from the addition of the proposed development into the existing cumulative context (existing and consented development i.e. Tralorg Wind Farm) are considered as part of the baseline description and the assessment of impacts presented in Section 5.6.

5.4 Baseline Conditions

5.4.1 Landscape and Landscape Context

Location

The location of the proposed development is shown in Figure 5.1.

The proposed development is situated in South Ayrshire. Its alignment commences at the Tralorg Wind Farm and routes south towards Tormitchell Quarry, crossing the minor road (Dinvin Road) to the east of the property at High Troweir. The alignment then turns south-west towards the community of Pinmore, running along a valley parallel with Dinvin Road and the Water of Assel. To the east of Pinmore, the alignment turns south, crossing the River Stinchar and then continues south-east on an orientation which lies parallel to an existing track and footpath. A terminal pole would be located immediately north of the minor road east of Pinwherry and north of Muck Water (see Figure 5.1).

The connection would be completed by underground cable crossing Muck Water and the existing 275 kV OHL, before connecting into the Mark Hill substation at NGR NX23724 86057. Other, smaller watercourses would also be crossed by underground cable.

The overall length of the proposed development is 14 km, comprising 9.4 km of OHL and 4.6 km of underground cable.

Topography and Hydrological Features

Figure 5.1 illustrates the topography within the study area. The landscape of the study area is characterised by a narrow, gently undulating valley enclosed by foothills. The landscape is formed by movement of the Southern Upland Fault (SUF) which runs from Girvan in the south west to Dunbar in the north east, across central and southern Scotland. The SUF has influenced the alignment of the Girvan and Stinchar valleys (between which the alignment lies), as well as the orientation of the foothills, moorland and ridges between them.

General topographic patterns follow a south-west orientation, which lie parallel to the main fault. The Stinchar Valley Fault, sited in the south of the study area, follows this orientation and has created a pronounced geological boundary. The alignment of the proposed development predominantly routes through the Water of Assel valley, a narrow valley which lies between Tralorg Hill, Troweir Hill and Dalfask Hill in the west and Greenhill, Auchensoul Hill, Kirkland Hill, Bennan Hill and Daldowie Hill in the east.

Watercourses are frequent within the landscape. In the north of the study area, the Penwhapple Burn flows in a west- east direction, flowing into the Water of Girvan which outfalls to the sea at Girvan in the north.

Throughout the majority of the study area, a number of minor burns flow from the hills down into the Water of Assel valley, forming tributaries to the Water. These water features create shallow valleys in the surrounding hills.

The River Stinchar forms the largest water feature within the study area, located to the south east. The meandering watercourse lies within a broader valley than the Water of Assel, however is contained by hills of a similar character, with gentle slopes and broad tops.

Landscape Character Types

Figure 5.2 indicates the location and extent of a number of constituent landscape character types within the study area. These are based on the findings of the following publications:

- Scottish Natural Heritage (1998) Ayrshire Landscape Assessment No 111⁴; and
- South Ayrshire Council (2013) Landscape Wind Capacity Study and Appendix⁵.

The South Ayrshire Landscape Wind Capacity Study (LWCS) documents have been used in this assessment as they contain the most up to date descriptions of the character of each landscape type. It should be noted, that the sensitivity ratings provided in the LWCS relate to wind turbines and wind farm developments and are therefore considered of limited relevance to this assessment.

The SNH landscape assessment for Ayrshire has identified three Landscape Character Types (LCTs) within the study area:

- the Foothills LCT;
- the Intimate Pastoral Valley LCT; and
- the Plateau Moorlands LCT.

The LWCS was informed by the SNH landscape assessment. The SNH LCTs were reviewed in the field by the authors of the LWCS and this process resulted in some minor amendments to the boundaries of some LCTs. Within the study area, the LWCS has split the Foothills LCT into two separate LCTs, and, has renamed the Plateau Moorland LCT.

The LCTs classified by the LWCS which lie within the study area are:

- LCT13 – Intimate Pastoral Valleys;
- LCT17c – Foothills with Forest and Wind Farms;
- LCT17e – Coastal Foothills; and
- LCT18c – Plateau Moorlands with Forestry and Wind Farms.

For the purposes of this assessment, the LCTs categorised by the LWCS and their descriptions have been adopted as they relate to the study area.

The proposed development would pass through each LCT, but, would predominantly be located within the Foothills with Forest and Wind Farms LCT. A description of the key characteristics of each LCT is presented in Table 5.3 below.

Table 5.3: Landscape Character Type Descriptions	
LCT <i>Sensitivity</i>	Description
LCT13 - Intimate Pastoral Valley <i>Medium-High</i>	Intimate Pastoral Valleys have been cut into the foothills and moorlands of the Ayrshire uplands. The Stinchar Valley is an example of this LCT. The Stinchar Valley lies within the Southern Uplands Fault zone. It is a narrow valley of medium scale with steep slopes and a relatively flat bottom. Land cover is dominated by the structure of broadleaf woodland which includes shelterbelts, riparian woodland and policy woodlands which separates the valley pasture into small parcels of fields. Other field boundaries are comprised of stone dykes and some hedgerows. The valley is strongly contained by the adjacent uplands. Settlement is dispersed along the valley, often located at key bridging points.

⁴ Land Use Consultants 1998. Ayrshire's Landscape Assessment. [Scottish Natural Heritage Review](#) No 111.

⁵ These guidance documents were only referenced insofar as their categorisation of landscape character types and the baseline description of these areas as it is a

Table 5.3: Landscape Character Type Descriptions

<p>LCT17c - Foothills with Forest and Wind Farms <i>Medium</i></p>	<p>This LCT covers a large area, with only the south-western extent of the LCT lying within the study area. In the east of the LCT, the landscape is characterised by an expansive, undulating plateau. To the west, and in the area of the proposed development, the landscape forms a narrower band of hills between the Girvan Water and Stinchar valleys. More pronounced hills lie on the outer fringes of this landscape and form prominent 'landmarks', visible from the Girvan and Stinchar valley's and from the Upper Girvan Water. The south-western orientation of fault lines has strongly influenced the topography of the Foothills.</p> <p>The gently undulating landform rises to form subtly rounded indistinct hills with occasional, more pronounced, hills with steep slopes and defined tops lying on the outer fringes of this landscape. These hills include Kirkland and Benan Hills which lie on the northern edge of the Stinchar Valley and form the southern boundary of the study area.</p> <p>This landscape has a simple land cover pattern dominated by extensive coniferous plantations and grass moorland. Some walled pastures and small riparian broadleaved woodlands occur on outer hill slopes. Lower slopes, such as those in the location of the northern and central sections of the proposed development, are of a pastoral character, with medium sized fields enclosed by a mix of fences, stone walls and hedgerows. The presence of extensive commercial forestry and wind farm development on the upper elevations limits the sense of naturalness, although this landscape can feel secluded due to the absence of settlement and major roads, particularly in the minor valleys which dissect the plateau, such as that formed by the Water of Assel in the location of the proposed development.</p> <p>The foothills are sparsely settled. The B734 and two minor public roads cross this landscape and access tracks are also present within forestry. The eastern-most minor road crossing these foothills forms National Cycle Route 7. This landscape is seen in close proximity from popular hill walks within the Carrick Hills. The edge hills of these foothills are also highly visible from the well-settled Girvan and Stinchar valleys. The small reservoir of Penwhapple is located in the western part of these foothills, outwith the study area to the north.</p>
<p>LCT17e – Coastal Foothills <i>Medium</i></p>	<p>This landscape is broader in the north but tapers in the south to form a fairly narrow band of hills. The study area for the proposed development includes the northernmost portion of the LCT, as it lies between the local road which passes through the Water of Assel valley, and Laggan Hill.</p> <p>The western edge of these hills, and particularly the craggy hills between Saugh, Doune and Laggan Hills which lies along the south western edge of the study area, are highly visible from the landscape along the coastline and form an integral part of the setting to Girvan and the coast. The steep-sided northern slopes of the group of hills centred on Troweir Hill are additionally important in providing a backdrop to the lower lying landscapes in the north, such as the Lower Dale LCT (LCT11) which extends to the east of Girvan.</p> <p>The rugged steep slopes and often craggy summits of these coastal hills make them appear higher than they are. The highest hills lie to the northeast and attain heights of between 250-300m but with relative relief only around 200m in views from the A714 and Stinchar valley. A lower undulating platform occurs in the south-west raised above the coast and punctuated by occasional landmark hills. The irregular landform creates a degree of enclosure, with interior settled glens and broader basins surrounded by higher ridges and tops. These hills are sparsely settled with farms sited in narrow valleys and on the lower coastal platform to the south-west.</p>

Table 5.3: Landscape Character Type Descriptions	
	<p>The northern hills are predominantly steep sided with the exposed hills against the coast featuring craggy upper slopes and summits. The narrow band of hills immediately backing the coast between Pinbain and Byne Hills and the steep-sided Laggan and Saugh Hills form key landmark features.</p> <p>The upper hill slopes have a simple pattern of unimproved grassland and moor. Wetter basins and areas of semi-improved pasture occur between hills and on lower hill slopes and these are broken by occasional small mixed woodlands. More extensive coniferous forestry occurs in the lower-lying areas in the south of the LCT.</p> <p>As it lies within the study area, the LCT is very sparsely settled with small farms and houses sited in sheltered valleys within these hills, associated with minor public roads which cut through the valleys.</p> <p>These coastal hills are little affected by extensive forestry and infrastructure development such as wind farms, unlike more extensive uplands within South Ayrshire. Areas of semi-natural vegetation on the more rugged hills increase the sense of naturalness although the general intervisibility of the wider farmed and settled landscapes limits a strong sense of wildness.</p>
<p>LCT18c - Plateau Moorland with Forestry and Wind Farms Medium</p>	<p>This extensive landscape comprises a relatively low upland plateau which forms an even and generally indistinct edge to the smaller scale settled Intimate Pastoral Valley (LCT13) of Stinchar Valleys as it lies within the study area. The LCT is formed of a simple, gently undulating upland plateau with generally rounded and subtle topography. Larger hills rise to around 300m. The extensive forest cover of this area tends to 'flatten' and mask underlying topography and some occasional steeper slopes occur.</p> <p>The landscape generally does not make a strong contribution to the wider landscape composition; however, it provides a simple foreground to the distant Galloway and Carrick Hills in views from roads and hills to the west. This character type extends into Dumfries and Galloway to the southeast where it comprises part of a much more extensive tract of upland plateau, characterised by forest cover and wind farm development.</p> <p>This landscape has an expansive scale due to its simple, gently undulating plateau, landform and absence of settlement. The expansive areas of forestry and wind farm development present within the landscape reduce openness and there are few remaining areas of open moorland within this character type.</p> <p>This character type is very sparsely settled. No properties or roads pass through the LCT as it lies within the study area. The operational wind farms of Arecleoch and Mark Hill are dominant features, located outwith the study area to the south east.</p>

Landcover

Vegetation cover in the study area reflects the human influence upon land use and management. In the north of the study area, vegetation is dense along the edges of water bodies. Scrubby vegetation and roadside trees lie alongside the local road which runs along the valley floor. In the lower areas of the valley and along the valley walls, fields of improved and semi-improved grassland have been established and are used primarily for grazing.

Vegetation within the central extent of the study area is comprised of shelterbelts and hedgerows along field boundaries, marshy grassland within areas associated with field drains or minor burns, and medium sized plots of forestry which are largely found in the landscape which surrounds the quarry and Hadyard Hill and Assel Valley wind farms. Agricultural grassland remains the predominant land cover.

To the south, as the alignment crosses the River Stinchar, the vegetation cover slightly increases, with broadleaved woodland present in large swathes along either bank of the Stinchar near Asselfoot Farm. Pockets of woodland align the river as it meanders along the valley. Agricultural grassland extends across the slopes above the valley floor, with large areas of coniferous plantations at higher elevations on the moorland landscape which punctuates the rough grass and heather ground cover.

On the uplands, in the south of the study area, rough grass and heather are the dominating vegetation types.

Land Use

Land use in the study area comprises agricultural grazing land across the lower lying areas which sit adjacent to the Water of Assel and its tributaries, and alongside the River Stinchar. Areas of forestry are present on the hillsides.

The Breedon's Tormitchell Quarry is located at a site directly to the east of the proposed development (see Figure 5.1). The quarry produces aggregates, asphalt products and ready-mix concrete. A second, smaller quarry is located on the opposite side of the road.

There is a high density of wind energy development within the study area. Hadyard Hill Wind Farm is located approximately 350 m east of the proposed development alignment at its closest point, sited on a broad plateau on the foothills of Auchensoul Hill. Tralorg Wind Farm sits directly adjacent to the commencement of the OHL, and Assel Valley Wind Farm is located on the upper slopes and summit of Troweir Hill, approximately 1 km to the west of the alignment.

Landscape Designations

The location and geographical extent of landscape designations within the study area are shown on Figure 5.3.

The route alignment is sited within the Water of Assel valley, in the foothills of the Carrick Hills. The Carrick Hills are designated by SAC as a Scenic Area (SA) in the LDP, identified as a landscape of particular note. The proposed route alignment is entirely contained within this designation.

The South Ayrshire Council SA falls across a large area of landscape, extending from Ayr, along the coast in a wide band, before extending inland at the mouth of the Water of Girvan, and following the southern side of the valley formed by this water body to Kirkmichael. The SA covers the full landscape south of this waterbody, defined in the east by the South Ayrshire Council boundary, and west to the coast. The SA omits a large part of the Galloway Forest Park, before extending along the Duisk River valley. The SA boundary lies along the northern edge of a large extent of forestry which lies between Barrhill and Arecleoch, Chirmorie, Stranoch and Killgallioch wind farms, excluding this area of commercial forestry and large-scale wind energy development. No citation is provided identifying the special qualities of the SA. The LDP Policy: Protecting the Landscape states:

We will consider proposals within or next to Scenic Areas (as defined on the LDP environment map) against the following conditions.

- a) The significance of impacts and cumulative impacts on the environment, particularly landscape and visual effects as informed by the Ayrshire Landscape Character Assessment (SNH 1998)".*
- b) How far they would benefit the economy.*
- c) Whether they can be justified in a rural location.*

As it lies within the study area, the character of the landscape within the SA is influenced by the land uses within it (wind farms, quarries, agriculture and forestry). The proposed development would be compatible with these existing land uses, and it is considered that the landscape of the SA is able to accommodate the proposed development without undue consequence on the baseline landscape. The susceptibility to change as a result of an additional OHL is considered to be low.

The value of the SA, as a local designation, is considered to be high. Therefore, the sensitivity of the landscape within the South Ayrshire Scenic Area is considered to be medium.

No other designated landscapes are located within the study area.

5.4.2 Visual Amenity

Settlement

The main settlement within the study area is Pinmore, which is formed of a small cluster of semidetached and detached double storey properties located slightly east of the A714 road (Girvan to Wigtown), approximately 670 m west of the alignment of the proposed development at its closet point. The houses lie around the perimeter of a central area of community open space, and, are generally oriented across the valley in an easterly or south-easterly direction. Views from properties are not expansive, truncated by the hills on the eastern side of the valley. The majority of properties will have direct or slightly oblique views towards the proposed development.

Elsewhere, settlement comprises a series of scattered properties and farmsteads on the floor of the valley. Properties are well spaced, accessed by a local road network and frequently located within a complex of other farm buildings such as sheds and barns. Vegetation often demarcates property boundaries.

Views from residential properties and settlements are generally static, the same view being obtained daily. The value attached to these views is considered to be high, and its susceptibility to the type of development proposed is considered to be medium. Existing land uses are compatible with the proposed OHL and the scale and pattern of the landscape lends itself to accommodating the change proposed without changing the overall character of the baseline environment. The sensitivity of all residential receptors within settlements and communities is considered to be high.

Transportation Routes

Due to the topography of the landscape within the study area, transportation routes generally follow the line of valleys. This has resulted in transport routes which are contained by landform with corresponding containment and foreshortening or channelling of views.

A714

The A714 is located in the western side of the study area and provides a key road link between Girvan and Newton Stewart. As it passes through the study area, the road follows the line of valley formed by the lower reaches of the Water of Assel and the River Stinchar, and in parts is heavily bordered by dense woodland vegetation which focuses views within the road corridor and prevents a high degree of views out across the wider area. In some locations, more expansive views are available across the landscape to the south east particularly where the road routes east on the approach to Pinmore, near Laigh Letterpin.

B734

The B734 runs between Pinmore Bridge and Penkill, passing through Barr, in the south of the study area. The road follows the alignment of the Stinchar Valley, slightly elevated above the

valley floor. The road is aligned on both sides by a dense woodland border as it climbs up from its junction with the A714 and along the valley sides. Views from the road (as it lies within the study area) open up as elevation is gained and more extensive views across the landscape are intermittently available. The road is defined by a mix of hedgerows and post and wire fencing which vary the extent of views available from within the road corridor.

Unclassified Roads

Dinvin Road runs from Pinmore to Penkill along the floor of the Water of Assel valley. The road closely aligns with the water, and winds through the valley. This minor road provides access to the majority of properties located within the study area. It is bordered by a mix of scrubby roadside vegetation, hedgerows and post and wire fencing which varies the extent of views from the road. Views in the north are generally contained by vegetation and topography, however within the central and southern sections of the study area, views along the valley are open but are contained by valley topography.

The sensitivity of receptors on transport routes varies from medium in respect of general commuter road users who may be travelling alone and concentrating on the road rather than the adjoining landscape, and high in respect of tourists who are more likely to carry passengers, and who are likely to focus on the landscape.

Recreational Receptors

Recreational receptors are presented on Figure 5.3. Recreational activities within the study area are limited to walking trails which route through the landscape.

The Girvan to Barr Pathway runs in an east-west direction. As it enters the study area in the east, it crosses the top of a small valley created by a tributary to the Water of Assel, past the Assel Valley Wind Farm before descending through an area of coniferous forestry towards the Water of Assel. The path crosses the Water and Dinvin Road before gaining elevation on the eastern side of the Water of Assel valley, following an access track which runs along the northern edge of a second area of forestry. As the path continues to rise up the valley slope it nears the southern extent of Hadyard Hill Wind Farm before exiting the study area in the west.

Recreational receptors found within the study area are considered to be of high sensitivity. It is anticipated that each person carrying out these activities has high value for the landscape within which they are passing through, and a high susceptibility to change as their attention and interest is focused on the views they experience as they pass through the landscape.

Representative Viewpoints

The location of representative VPs are shown on Figure 5.4. Baseline views and photomontages are presented from each viewpoint in Figures 5.5 – 5.10. The following table presents a description of the existing view from each representative viewpoint.

Table 5.4: Representative Viewpoint Baseline View		
Viewpoint <i>Distance to Development</i> Receptor Type	Baseline View	Sensitivity
VP 1: Dinvin Road at High Trowier Farm <i>40 m west</i> Road user	The view from Dinvin Road at Upper Troweir Farm is contained within the valley floor. The topograph rises steeply on both sides of the valley and views are directed to the north and south, along the road corridor. Views across the valley landscape to the west are more open than those to the east, which are filtered by roadside vegetation.	Road user: Medium

Table 5.4: Representative Viewpoint Baseline View		
See Figure 5.5	<p>Wind turbines are present in the view to the north and east, with large farm buildings seen on the hilltop to the west, with the Upper Troweir Farm access leading up the hillside from the road.</p> <p>Existing overhead lines run across the eastern slope of Tralorg Hill and form a minor element in the view. More obvious is the telephone line which runs along the eastern edge of Dinvin Road, amongst the roadside vegetation.</p>	
<p>VP 2: Girvan – Barr Path at Dinvin Road <i>120 m south east</i></p> <p>Recreational Residential Workers</p> <p>See Figure 5.6</p>	<p>The view from the Girvan-Barr path is busy and cluttered, containing an active working environment associated with the Tormitchell Quarry and to a lesser extent the farm which is located within the same area.</p> <p>Wind turbines are clearly visible across the skyline, seen in combination with infrastructure and buildings associated with quarry operations. Electricity lines cross in the foreground of the view. Small pockets of coniferous woodland are scattered in the middle distance, with larger areas to the rear of the view.</p> <p>The view is contained by topography, and no long distance or expansive view is available.</p>	<p>Recreational: High</p> <p>Residential: High</p> <p>Workers: Low</p>
<p>VP 3: Junction of Dinvin Road with the Assel Valley Wind Farm access <i>340 m south east</i></p> <p>Residential Road user</p> <p>See Figure 5.7</p>	<p>At this viewpoint, at the confluence of the Dalfask Valley and the Water of Assel valley, the valley floor widens. The eastern hills are at a slightly greater distance from the road user and from the residential property which lies at the bottom of the Assel Valley Wind Farm access track – Craigbae.</p> <p>It is a tended view, agricultural fields grazed by sheep, and shelter belts of trees breaking the skyline. Plantation forestry is visible to the rear of the view in the south, and areas of scrubby vegetation is present adjacent to water features and along field boundaries. Farm access tracks are visible across the landscape, and the line of the Water of Assel is demarcated by sharp, low cliffs which drop from the hillside.</p> <p>A telephone line runs along the eastern edge of Dinvin Road, and electricity infrastructure is visible on the hillside to the west.</p>	<p>Residential: High</p> <p>Road user: Medium</p>
<p>VP 4: Pinmore Residential <i>790 m east</i></p> <p>See Figure 5.8</p>	<p>From the community area at Pinmore, the view is directed towards the southern slopes of Daldowie Hill, which contain views and create an intimate valley setting for the community.</p> <p>A single wind turbine sits above an area of broadleaved woodland associated with the property at Machlachinston, and a telecommunications mast is located alongside.</p> <p>In the foreground of the view, telecommunication and electricity infrastructure connect into two storey-semi-detached properties.</p> <p>Vegetation sits low in the view, associated with the line of the Water of Assel which runs below the settlement. A combination of post and wire fences and hedgerows divide fields across the hills in the background of the view.</p>	<p>Residential: High</p>
VP 5: A714 Layby	<p>The view from a farm track near a layby on the A714 provides an open view across the valley landscape, while the eastern hills of the Water of Assel valley prevent</p>	<p>Road and commuter rail user: Medium-Low</p>

<p><i>1.3 km south east</i></p> <p>Road and commuter rail traveller</p> <p>Recreational (rail traveller)</p> <p>See Figure 5.9</p>	<p>extensive views across a wider area. The view is of an agricultural landscape, with small clusters of farm buildings and residential development tucked into the landform.</p> <p>Distribution lines extend down into the valley in the foreground of the view, running with the grain of the topography. A railway line is visible to the south east of the view, and, blends in with other linear elements in the view, such as field boundaries, access tracks and belts of scrubby vegetation.</p> <p>Elements of human intervention are common to the view, and, contribute to the agricultural working character of the landscape when viewed from this location. The hills to the rear of the view appear more natural however still contain evidence of activity and intervention, indicated by the presence of stone walls and forestry plantations.</p>	<p>Recreational (rail traveller): High-Medium</p>
<p>VP 6: Balligmorrie</p> <p><i>640 m west</i></p> <p>Road user</p> <p>See Figure 5.10</p>	<p>The view from Balligmorrie is of a tended and inhabited valley landscape, associated with agricultural farm activity. Telecommunications and electricity infrastructure pass through the view, connecting with residential and agricultural properties within the landscape.</p> <p>Vegetation is prolific, associated with the River Stinchar, with residential properties and also as part of medium sized woodlands that fall across the upper hills in the background of the view. Well managed hedgerows align the minor road which passes through the valley.</p> <p>Topography is undulating across the valley as it rises from the valley floor, and a cairn sits on a minor hilltop to the west of the view.</p>	<p>Road User: Medium</p>

5.5 Potential Impacts and Mitigation

5.5.1 Construction Phase

Potential impacts during construction of the proposed development are detailed in Table 5.5 below, which also details the relevant receptor and mitigation or control measures, where appropriate.

Potential Impact	Receptor	Mitigation/Control Measures Proposed
<p>Site clearance; excavation of the ground for access track construction, pole base construction; undergrounding of the cable section; placement of temporary construction compound; reinstatement works</p>	<p>Landscape fabric</p>	<ul style="list-style-type: none"> The proposed development will follow the alignment of existing tracks and forestry roads as far as practicable. The creation of new tracks or markings across the landscape fabric will be minimised. Reinstatement of the ground condition following completion of construction activities in areas of temporary access, particularly access tracks, the construction compound and the cable section, where existing vegetation will be replaced on the excavated trench. Temporary stone tracks associated with the construction of the

Table 5.5: Potential Impacts during Construction and Relevant Mitigation/Control Measures		
		<p>underground cable will be removed upon completion of construction and any damage to the landscape fabric will be restored to a condition in keeping with adjacent ground conditions.</p> <ul style="list-style-type: none"> • Excavated material will be stored appropriately and will be used for back filling and dressing of disturbed areas. • Where possible, laydown areas will be located in areas that are already disturbed or cleared of vegetation • Laydown areas, the temporary construction compound and all other temporary facilities will be removed, and the landscape restored following completion of the construction works. • All working areas would be restricted as far as practicable to the specified areas and demarcated to prevent incursion of site plant onto non-construction areas. • Material storage/ stockpiles would be retained for the shortest duration practicable and would be sited to avoid visual intrusion to neighbouring receptor locations. • Public access along roads and paths will be retained throughout the construction period. • Night lighting of construction sites/ compounds will be minimised within the requirements of health and safety, and only in use at locations where activity is being carried out.
Loss of mature vegetation within the proposed development site, and consequent construction of the poles.	<ul style="list-style-type: none"> • Landscape character • Visual amenity/ visual receptors 	<ul style="list-style-type: none"> • Tree felling will be limited to only those necessary for the safe construction and operation of the grid connection.
Presence of construction activity (including movement) and construction equipment such as excavators, tractors and scaffold tunnels.	<ul style="list-style-type: none"> • Landscape character • Visual amenity/ visual receptors 	<ul style="list-style-type: none"> • All construction equipment will be removed, and the landscape restored following completion of the construction works. • Night lighting of construction sites/ compounds will be minimised within the requirements of health and safety, and only in use at locations where activity is being carried out. • Material storage/ stockpiles would be retained for the shortest duration practicable and would be sited to avoid visual intrusion to neighbouring receptor locations.

Table 5.5: Potential Impacts during Construction and Relevant Mitigation/Control Measures		
		<ul style="list-style-type: none"> Where possible, laydown areas will be located in areas that are already disturbed or cleared of vegetation.

5.5.2 Operation Phase

Potential impacts during operation are detailed in Table 5.6 below, which also details the relevant receptor and mitigation or control measures, where appropriate.

Table 5.6: Potential Impacts during Operation and Relevant Mitigation/Control Measures		
Potential Impact	Receptor	Mitigation/Control Measures Proposed
Presence of new wood pole line (including conductor) within the landscape; presence of cleared wayleave.	<ul style="list-style-type: none"> Landscape character Visual amenity/receptors 	<ul style="list-style-type: none"> The height of the poles would typically be 11 m above the adjoining ground level (including steel work and insulators). Pole heights may be increased locally (up to a maximum height of 18 m) where required to safely cross features such as watercourses and access tracks, such as those at Tormitchell Quarry. Where possible, the proposed alignment has been routed to reduce its impact on the character of the landscape, and its prominence in views from the wider area.
Disturbance, movement and activity associated with maintenance activities.	<ul style="list-style-type: none"> Landscape fabric Visual amenity/receptors 	<ul style="list-style-type: none"> Where maintenance activities are required, they will be programmed to ensure that they are undertaken in a timely and localised manner. All maintenance equipment will be removed, and any disturbed ground reinstated (if applicable) immediately following completion of the maintenance works.

5.6 Residual Impacts

The following section assesses the impacts arising from the development of the OHL section of the proposed development. It does not assess impacts experienced as a result of the cable section of the route. Impacts on the landscape resource and visual amenity of the area as a result of the undergrounding of the cable would only be experienced during construction, as the cable trench is cut, and material stored. Mitigation has been proposed to reduce the impact of these works. Impacts would be temporary, short term, and essentially reversible. Once reinstated, impacts arising from the development of this element of the project would reduce to negligible over a short period of time as vegetation along the cable trench re-establishes.

Occasional maintenance activity may be required from time to time, however any impact arising from these works would be short term and temporary and would be mitigated by the measures outlined in Table 5.4 above.

5.6.1 Impacts on Landscape Character

The proposed development would directly impact upon the landscape fabric in the areas of the pole foundations. Each pole excavation would disturb an area of 3 m² and would be 2 m deep,

and, would measure between 10 m and 18 m in height above ground level, dependant on location and ground clearance requirements (see Chapter 3: Project Description).

To facilitate the construction and operation of the proposed development, some small areas of woodland would be removed, such as along the edge of an area of coniferous woodland to the south of Tormitchell Quarry, and an 0.33 hectare (ha) swathe through an area of woodland to the east of Pinmore. While this vegetation removal would directly impact on the fabric of the landscape, it would not detract from the contribution that these areas of woodland make to the overall character of the landscape, nor the integrity of the woodland areas themselves as landscape features.

Impacts arising as a result of the proposed development would be largely contained with the Water of Assel valley, with some localised impacts occurring within the southern extent of the Stinchar Valley Landscape. Due to the nature of topography in these areas, the influence of the proposed development on the wider area would be substantially constrained.

Impacts on LCT13 – Intimate Pastoral Valley

Approximately 1.7 km of the proposed development runs through the Intimate Pastoral Valley LCT, perpendicular to the overall orientation of the Stinchar valley. The line would pass across the brow of Daldowie Hill, and descend into the landscape of the LCT, adjacent to the path of a burn which feeds to the River Stinchar. The proposed development would cross the river, and, rise up across the landform towards the B734 which runs through the valley landscape. The proposed development continues to climb, exiting the valley and crossing into the Plateau Moorland LCT.

In this area of the Intimate Pastoral Valley LCT, the landscape is well tended and linear features such as the existing distribution and phone line infrastructure, local roads, stone walls and post and wire fencing contribute to the character of this managed landscape. The proposed development would add to the presence of infrastructure within the landscape introducing both new vertical element (poles) and linear elements (conductors). The proposed development would fit comfortably within the existing character of the landscape, rather than contrasting with it.

The new grid connection would have a limited impact on how the existing landscape of the Intimate Pastoral Valley is perceived. Overall, the magnitude of impact caused by the proposed development on the character of the Intimate Pastoral Valley LCT is considered to be low, resulting in minor impacts. These impacts would be localised within the immediate area surrounding the OHL. Further north, as the LCT extends to the north east and south west of the proposed development, impacts would quickly reduce to none within a small distance from the development.

Impacts on LCT17c / 17e– Foothills with Forest and Wind Farms/ Coastal Foothills

The Foothills with Forest and Wind Farms LCT and the Coastal Foothills LCT have been considered together in this assessment. This is because the landscape as it lies within the study area is the transition zone between the two LCTs, and there is little difference in the character of the landscape in this area.

The majority of the proposed development lies along the boundary of the Foothills with Forest and Wind Farms LCT and the Coastal Foothills LCT, and, would impact on a small part of these two large landscape types. The nature of the topography surrounding the proposed development would contain the influence of the OHL on the overall character of the LCTs, with impacts limited to within the valley landscape only.

The character of the landscape within this area is defined by the presence of wind turbines, quarries, the meandering character of the Water of Assel (and its northern tributary), forestry and access infrastructure (roads and tracks). It is a working landscape. The proposed

development would be consistent with this established character. In some areas the proposed development would add to the assemblages of infrastructure, such as in the area of Tormitchell Quarry, where a phone line and an existing distribution line are adjacent. These impacts are experienced within a localised area, and not elsewhere along the proposed developments alignment.

The proposed development would not impact the way that the landscape is perceived by those who live, work or visit the area. Impacts would be localised, as the proposed development would integrate with existing land uses and therefore the influence on the wider landscape character would be contained. In the area of the development, the magnitude of impact caused by the proposed development on the character of the Foothills with Forest and Wind Farms LCT and the Coastal Foothills LCT is considered to be low-medium, resulting in minor impacts. Across the wider LCTs, impacts would quickly reduce to none as the influence of the development is restricted to within the valley.

Impacts on LCT18c - Plateau Moorland with Forestry and Wind Farms

In the vicinity of the proposed development, the character of the landscape transitions between the enclosed, linear landscape of the Stinchar Valley, and the broader more open landscape of the moorlands in the east.

Impacts on the Plateau Moorland with Forestry and Wind Farms LCT would be confined to locations adjoining the proposed developments alignment as it crosses into this LCT from the Stinchar Valley. The ZTV indicates the viewshed coincides with extensive areas of forest cover which would screen the proposed development. The influence of the proposed development would be contained across the immediate northern slopes of the moorland area, focussed towards the Stinchar Valley landscape which is already influenced by existing infrastructural elements.

Based on the preceding analysis, the magnitude of impact arising from the proposed development on the Plateau Moorland with Forestry and Wind Farms LCT would be low-medium in the immediate area surrounding the OHL as the open landscape lies between two areas of woodland. The magnitude of impact will reduce to none in the wider extents of the LCT where theoretical visibility ceases, and woodland cover reduces the influence of the line across the wider LCT. On this basis, the residual impact on the character of this LCT would range from negligible across the majority of the LCT, to minor in the local area surrounding the OHL.

5.6.2 Impacts on Landscape Designations

The proposed development would be located wholly within a landscape designated for its scenic qualities. The special qualities of the South Ayrshire SA are not defined and therefore an assessment has been made based on the quality of the landscape found within the study area which would be impacted on by the proposed development.

The alignment of single wooden poles, connected by three parallel conductors would be located within a minor valley which forms a small portion of the wider SA, and which is characterised by human activity including wind turbines, electricity distribution and telephone lines, quarrying, forestry, transport and agriculture.

The landscape is of a scale which has the capacity to absorb a development of the size and scale proposed, without adversely impacting on the overall experience or appreciation of the scenic qualities associated with the SA, as it lies across the Carrick Hills. The proposed development lies low in the valley landscape for the majority of the alignment, and topography contains the influence of the alignment across the wider area. Where the proposed development runs along hilltops, such as above Pinmore and to the south of the Stinchar Valley, the extent of impact is limited by woodland and plantation forestry which is present within the immediate area.

Due to the level of activity and man-made features within the immediate area surrounding the proposed development, and the relatively contained influence of the line on the wider landscape, it is considered that the proposed development would not impact on the integrity of the landscape to the extent where its reason for designation is compromised.

The magnitude of impact arising from the construction and operation of the proposed development is considered to be low. The impact is considered to be minor.

5.6.3 Impacts on Visual Amenity of Settlements

The proposed development would be viewed from residential properties and public spaces within the community of Pinmore, located to the west of the alignment as it exits the Water of Assel valley, routing east to cross the toe of Daldowie Hill towards the Stinchar Valley. Due to the fall of the topography into the Water of Assel valley, the aspect of properties within the community face towards the valley and towards the proposed development although in some instances views would be slightly more oblique.

The magnitude of impact on views from within the settlement of Pinmore is considered to be medium. The alignment would run across the upper levels of the hills on the eastern side of the valley, introducing a new linear feature along the skyline of the view. A number of electricity and telephone lines run into the settlement currently, however these are positioned at lower elevations, backclothed by the hillside. The proposed development would be more prominent than other linear infrastructure, and, extend across a large proportion of the view. While it is considered that the proposed development would not directly contrast with the existing view, as the size and scale of the development is comparable to other similar elements in the landscape, it would form a new structure within the landscape in this area. The residual impact on views from Pinmore would be moderate.

Viewed from individual properties within the valley landscape, the proposed development would introduce a new feature into views which already contain a number of infrastructure elements, such as telephone lines, distribution lines, wind turbines, roads as well as developments such as quarries and plantation forestry. The introduction of a new grid connection within this valley would result in a magnitude of impact of low-medium for the residential communities within the valley. The impact would be minor-moderate.

5.6.4 Impacts on Views from Roads and other Transport Receptors

Southbound travellers on the A714 would only have views to the proposed development briefly after the road has crossed the railway line near Dinvin Motte and descends toward Pinmore. From this location, the road routes around the landform and provides brief but clear views into the Water of Assel valley for those travelling south. The proposed development would be visible on the hillside to the east of the valley, however would not be a defining or key feature within views from the road and would not be skylined. The proposed development would be seen at a distance of approximately 750 m, within the context of farm buildings, existing linear infrastructure such as distribution and phone lines and field boundaries. The proposed development would be backclothed by landform and would not be a prominent feature in the view, nor would it contrast with existing elements within the landscape. As the road descends further into the valley, it is heavily bordered by roadside trees and woodland which obscure views into the valley and towards the proposed development.

The magnitude of impact for south bound road users on the A714 is negligible-low. The impact would be minor.

For road users travelling north, the proposed development would appear briefly and obliquely to the east as the road rises out of the valley above Pinmore. The proposed development would form a barely perceptible feature in the landscape, lying below the skyline and backclothed by

the valley walls. As the road bends to the north west impacts would reduce to none as the proposed development would be to the rear of the road user. Impacts for northbound travellers are considered to be negligible.

From the B734, between Pinmore Bridge and Barr, impacts would be experienced between the property at Pinmore Mains and Balligmorrie. Hedgerows align the B-road and intermittently provide partial screening/filtering of views towards the proposed development. The landscape of the Stinchar Valley contains a high proportion of woodland and tree cover. The view from the road is of a settled landscape, and, contains a number of existing vertical and linear elements including phone and distribution lines, farm tracks and field boundaries formed of stone walls, hedgerows and post and wire fencing, as well as the road itself. The proposed development would not introduce an unfamiliar element within views and would not constitute a dominant or defining feature.

For eastbound road users, from the junction with the A714 at Pinmore Bridge the road rises above the Stinchar Valley and views are contained by dense roadside vegetation and topography. At Pinmore Mains, the aspect becomes more open, and intermittent views towards the proposed development would be experienced. Further along the mid-slopes of the valley, more expansive views would occur as the road user nears the location of where the proposed development would cross the road, perpendicular to the direction of travel, resulting in a medium magnitude of impact. Once the road user has passed beneath the line, the proposed development would be behind eastbound vehicles.

For those travelling west, the proposed development would be revealed as the road rises up from the valley floor and is no longer enclosed by roadside vegetation (e. g. near Balligmorrie) and expansive views open up across the valley. The proposed development would be evident as it crosses Daldowie Hill and across the Stinchar Valley. The proposed development would be visible for an approximately 1km stretch of road, running perpendicular to the road user, until the line passes over the B734 and is to the rear of the road user. The magnitude of impact would be medium, resulting in a minor impact for west bound road users.

For users of Dinvin Road which passes between Pinmore and Penkill, the development would form a new element within a view which already contains linear infrastructure. From Pinmore, travelling north, the line would sit at a distance of approximately 500 m on the midslopes of Daldowie Hill, becoming gradually closer to the road as it nears Dalfask. The view across the landscape in this area is more open, and roadside vegetation is intermittent. As the valley narrows north of Dalfask the line runs parallel with the road, separated from road users by the Water of Assel until Tormitchell, where the line would run directly adjacent to the road. In this location, a phone line also runs along the roadside and the proposed development would increase the level of infrastructure in the view.

The line crosses Dinvin Road at High Troweir, running across an area of low lying landscape before climbing up the southern slopes of Tralorg Hill to connect into the Tralorg Wind Farm substation. The line would sit in the direct view of road users, running parallel with the road.

From High Tralorg, Dinvin Road dips down into the Penwhapple Burn valley and views of the alignment cease.

For south bound road users, the proposed development would be revealed as it runs parallel to, and then crosses the road near High Troweir Farm. From this location, views would be very similar to those experienced by northbound users as the alignment runs in parallel with the road.

Currently, as users of Dinvin Road pass through the landscape, views contain a number of infrastructural elements. Power lines and telephone lines cross through the landscape and wind turbines are a common feature on the tops of hills, particularly at the northern end of the route. Tormitchell Quarry, and the slightly smaller neighbouring quarry contribute a working quality to

the view and have created large scars in the landscape. Large trucks passing along the road between the quarries and Penkill (and further) are frequent. The proposed development would introduce an additional linear feature into the view from the road. The line would not be out of context with the existing view, nor would it form a defining element within the view. In certain, localised areas such as along the road near Tormitchell Quarry, the alignment would create proliferation of linear infrastructure within close proximity to one another which could result in a 'wirescape', however the stretches of road where this would be an impact are short and infrequent.

The magnitude of impact for users of Dinvin Road would be medium at most, resulting in a moderate impact (at most).

5.6.5 Impacts on Views from Recreational Receptors

For eastbound users of the Girvan – Barrhill Path, the ZTV indicates that the proposed development would come into view as the path rises up to Troweir Hill. Theoretical visibility is continual as the path then descends down into the Water of Assel Valley. In reality, the proposed development would first appear in views from the path as the user exits an area of woodland on the valley floor, and crosses Dinvin Road.

The path then crosses through an area of rough pasture below the Tormitchell Quarry, passing underneath the proposed development. Once the eastbound path user has passed underneath the alignment, some highly oblique views of the OHL would remain until the path user has crossed two footbridges and passes between two small woodland plantations.

For westbound path users, views of the proposed development would appear as the path breaks across the summit of a farm track which runs around the southern edge of the Tormitchell Quarry. From this location elevated views across the immediate landscape are available and the proposed development would become a new element in the view. The line would lie low in the landscape, below the path user and would be viewed in combination with existing OHLs and phone lines which pass through the landscape in this area.

From this elevated position, the path then descends along a quarry track, and views are screened by topography and by vegetation.

The main impact on users of the Girvan – Barrhill Path would be experienced within the area of Dinvin Road, where walkers pass underneath the alignment. The proposed development would be viewed within the context of existing distribution lines, quarry and farming activity, road and wind farm infrastructure. A new grid connection alignment in this area would contribute to this context, adding a further feature but one which is not considered to be out of character with the existing view nor would affect the overall enjoyment or experience of the path from this area.

The magnitude of impact in views from this section of the Girvan – Barrhill Path would be medium, which would result in an overall moderate impact. From the wider path route, any views of the proposed development would have a magnitude of impact of negligible or none, and overall impacts would be minor at most.

5.6.6 Construction Impacts

During construction there would be short term landscape and visual impacts arising from the presence of plant and activities on site, including:

- Clearance of vegetation;
- Site entrance and access works;
- Machinery and material storage;
- Vehicle movements;

- Excavations for pole foundations and cable trenches, including backfilling; and
- Construction-related lighting during winter months (if required).

Construction impacts will be short term and temporary. The construction of the full line is anticipated to take 10 months and will be undertaken in phases to ensure that any construction impacts are concentrated in a single area rather than across the full alignment. It is considered that the mitigation measures presented in Section 5.5 will ensure that landscape and visual impacts arising from the proposed development are no more than moderate.

Following construction, restoration of disturbed areas would take time to be re-established to the original condition. With the implementation of an Environmental Quality Management Plan (EQMP) which would include measures for post-construction restoration, bare ground would soon become reinstated and re-vegetated. Peat turves would be stored as part of a peat management plan, and these would be used to encourage revegetation and promote restoration. The changes would affect the immediate landscape and VPs in close proximity to the development area from areas where ground conditions would be discernible, however these areas would be limited in extent.

5.6.7 Viewpoint Assessment

Table 5.7 below presents the viewpoint assessment for selected representative VPs. Baseline descriptions for each location are described in Table 5.4 in Section 5.3.3, and the reason for selection is explained in Section 5.2.1.

Table 5.7: Viewpoint Assessment		
Viewpoint Distance to Development Sensitivity	Assessment	Residual Impact
VP 01: Dinvin Road at High Trowier Farm <i>40 m west</i> Road User: Medium See Figure 5.5	Facing north along Dinvin Road at Troweir Farm, the proposed development would run down the southern slopes of Tralorg Hill, descending into the valley. The OHL would be skylined, and viewed in combination with wind turbines which currently are visible on the hilltop. Once within the valley, the OHL would lie adjacent to the road users and in close proximity. The introduction of the proposed development would result in linear infrastructure running along both sides of the road however would be in scale with existing elements within the view. The proposed development would not introduce a foreign element into the view from the road, but would increase the prominence of linear and vertical elements which are already present within the landscape. The magnitude of impact would be medium.	Moderate
VP 02: Girvan – Barr Path at Dinvin Road <i>120 m south east</i> Recreational: High Residential: High	From this location along the path, as the eastbound path user experiences the first views of the proposed development, the OHL would be viewed in the context of wind turbines, existing electricity and telephone infrastructure, quarry and farm buildings and forestry plantations. It is a view which is already characterised by built development. There would be no loss of existing features. The proposed development would add a new element within the view, but not one which is out of context, scale or character with existing elements in the landscape.	Recreational: Moderate-minor Residential: Moderate-minor

Table 5.7: Viewpoint Assessment		
See Figure 5.6	<p>For users of the Girvan-Barr path, views would be transient in nature and experienced over a short period of time. Impact on the experience of walking along the path would be localised. The magnitude of impact would be low.</p> <p>For the residential property located on Dinvin Road at the location of the viewpoint, a dense coniferous hedge would screen a high degree of views to the development. The line would pass behind small areas of conifer plantation and would then run along the edge of an existing area of forestry. While the proposed development would introduce a new feature in close proximity to the receptor, the impact would be reduced as the line would be backclothed by woodland and the overall view would remain unaltered. The magnitude of impact is considered to be low as the line will integrate with existing landscape baseline within this area.</p>	
<p>VP 03: Junction of Dinvin Road with the Assel Valley Wind Farm access</p> <p><i>340 m south east</i></p> <p>Residential: High Road user: Medium</p> <p>See Figure 5.7</p>	<p>The proposed development would pass to the east of the road user, at an oblique angle however for residents of Craigbae, at the entrance to Assel Valley Wind Farm, views would be direct from the eastern edge of the property.</p> <p>In the foreground of the view, a telephone line runs along the road edge, and provides some context to the type of development which would be introduced by the proposed development. The proposed development would sit in the middle distance, running across the valley floor and then extending up across the middle slopes of the hillside before becoming skylined in centre and south of the view.</p> <p>Trees which form a broken shelterbelt provide context to the new vertical elements and linear pattern which would be introduced by the proposed development, and due to their size and scale, would reduce the overall impact of the OHL within the southern portion of the view.</p> <p>The magnitude of impact would be medium for residents of Craigbae and medium-low for road users, as views would be oblique and fleeting.</p>	<p>Residential: Moderate Road user: Moderate-minor</p>
<p>VP 04: Pinmore</p> <p><i>790 m east</i></p> <p>Residential: High</p> <p>See Figure 5.8</p>	<p>The proposed development would run high along the brow of the landform, in the background of the view from Pinmore. The OHL would be skylined, introducing a new feature into the landscape in this part of the view. The proposed development would not be out of character with existing elements in the foreground of the view, however would extend across a large portion of the view and would be more prominent than similar infrastructure which is present in the landscape.</p> <p>The southern extent of the alignment, as it passes across the top of the hill and further away from the settlement would be screened from view by existing broadleaved vegetation associated with the property at Machlachriston.</p> <p>The magnitude of impact would be medium.</p>	<p>Residential: Moderate</p>
<p>VP 5: A714 Layby (representative of views from the A714 road and railway)</p>	<p>The proposed development would be located in the background of the view. It would be visible as a new linear feature across the hillside, and, would be viewed within the context of existing linear elements such as field boundaries, the railway line, farm access tracks and existing infrastructure which pass through the landscape.</p>	<p>Road user: Negligible</p> <p>Recreational: Minor</p>

<p><i>1.3 km south east</i></p> <p>Road and commuter rail user: Medium-Low</p> <p>Recreational (rail traveller): High-Medium</p> <p>See Figure 5.9</p>	<p>The proposed development would integrate with the existing view, and, is not of a size or scale where it would become a distinctive new feature. The character of the existing view would not be affected.</p> <p>The magnitude of impact would be low/ negligible for both receptors.</p>	
<p>VP 6: Balligmorrie <i>640 m west</i></p> <p>Road user: Medium</p> <p>See Figure 5.10</p>	<p>The proposed development would sit amongst other similar landscape elements which run through the valley landscape and would integrate with, rather than contrast with, the character of the existing view. The proposed development would increase the level of linear infrastructure within the view, and would intensify the presence of this type of development within the landscape as conductors pass across each other and vertical elements become more clustered.</p> <p>Existing vegetation would provide some screening of the proposed development, particularly in the area where the line would be skylined – this would reduce the overall impact of the development on the view from this location.</p> <p>The magnitude of impact would be low-negligible.</p>	<p>Road user: Minor</p>

5.6.8 Summary

Impacts arising from the proposed development would be localised to within the Water of Assel valley landscape, and within the lower reaches of the Stinchar Valley in the area of the development. Due to the nature of the topography, and the alignment of the proposed development lying low within the valley landscapes, impacts will be contained within a small area.

No overall impacts of more than minor are expected within the landscape of the study area and on the character of the LCTs through which the alignment will pass.

Impacts on the landscape within the South Ayrshire Scenic Area would be localised, limited to the landscape within the Water of Assel and Stinchar Valleys, in the vicinity of the proposed development. Due to the level of activity and existing man-made features within the immediate area surrounding the proposed development, and the relatively contained influence of the line on the wider landscape, it is considered that the proposed development would not impact on the integrity of the landscape to the extent where its reason for designation is compromised.

In views from Pinmore, the closest settlement to the alignment, the proposed development would run across the upper levels of the hills on the eastern side of the valley, introducing a prominent new linear feature along the skyline of the view. Linear infrastructure is present within the existing view, however is positioned at lower elevations and is backclothed by the hillside. The proposed development would not directly contrast with the existing view as the size and scale of the development is comparable to other similar elements in the landscape, however its prominence would be exacerbated by its skyline position.

From A- roads which run through the study area, views of the proposed development would be fleeting and brief. The development would be backclothed by the topography of the valley landscape and the OHL would not be a prominent feature in views.

From the B734, impacts would be limited to the area where the road user approaches and then passes beneath the proposed development. Existing infrastructure in views from this part of the road reduce the prominence of the proposed development.

For users of Dinvin Road which runs along the Water of Assel valley, views already contain a number of infrastructural elements. Power lines and telephone lines cross through the landscape and wind turbines are a common feature on the tops of hills, particularly at the northern end of the route. Tormitchell Quarry, and the slightly smaller neighbouring quarry contribute a working quality to the view and have created large scars in the landscape. The proposed development would introduce an additional linear feature into the view from the road. The line would not be out of context with the existing view, nor would it form a defining element within the view.

The only recreational route within the study area which would be impacted on by the proposed development is the Girvan-Barr Path. The main impact on users would be experienced within the area of Dinvin Road, where walkers pass underneath the alignment to the south of the Tormitchell Quarry. The proposed development would be viewed within the context of existing distribution lines, quarry and farming activity, road and wind farm infrastructure. A new grid connection alignment in this area would contribute to this context however is not considered to be out of character with the existing view nor would affect the overall experience of enjoyment of the path within this area.

A viewpoint assessment has been carried out from six locations within the study area. These locations represent a range of receptors with views to the proposed development. Moderate impacts were identified from Dinvin Road at Troweir Farm, where the alignment would pass in close proximity to the road user, from a residential property location on Dinvin Road at the junction with the Assel Valley Wind Farm, and from the settlement of Pinmore where the proposed development would introduce a new, prominent linear feature across the skyline of the view from this settlement. All other overall impacts are assessed as moderate-minor or less.

6. CULTURAL HERITAGE APPRAISAL

6.1 Introduction

This chapter identifies the likely impacts on cultural heritage assets associated with the construction and operation of the proposed development, and provides details of control measures where appropriate. The specific objectives of the chapter are to:

- Describe the cultural heritage baseline within the Inner Study Area (defined in section 6.2.1);
- Assess the archaeological potential of the Inner Study Area;
- Identify the potential construction (direct) and operational (indirect) impacts on cultural heritage assets; and
- Describe any mitigation or control measures proposed to address likely impacts.

This chapter is supported by:

- Technical Appendix 6.1: Cultural Heritage Assets within the Inner Study Area;
- Technical Appendix 6.2: Cultural Heritage Assets within the Outer Study Area with Predicted Visibility of the Proposed Development; and
- Technical Appendix 6.3: List of Sources Consulted.

Figures 6.1 and 6.2 are referenced in the text where relevant.

6.2 Methodology

6.2.1 Study Areas

Two study areas were used for the assessment:

- The Inner Study Area (Figure 6.1): the extent of the Inner Study Area covered by the desk-based study is shown on Figure 6.1. The locations of all of the heritage assets identified within this area are also shown on the figure, and Appendix 6.1 provides a description of each of these assets. Reconnaissance field survey was carried out within the Inner Study Area.
- The Outer Study Area (Figure 6.2): this extends 3 km from the proposed OHL and was used as the study area for the identification of heritage assets whose settings may be affected by the proposed development. The relevant assets are listed in Appendix 6.2.

6.2.2 The appraisal was conducted in accordance with the Chartered Institute for Archaeologists' (CifA) 'Code of Conduct' (2017) and 'Standard and Guidance for Historic Environment Desk-based Assessment' (2014).

6.2.3 Desk-Based Research

Inner Study Area

A detailed desk-based assessment was conducted for the Inner Study Area using a range of documentary, archival and bibliographic sources as described below. Technical Appendix 6.3 contains a full list of the sources consulted.

- Historic Environment Scotland Spatial Data Warehouse (HES 2018a): provided up-to-date data on the locations and extents of Scheduled Monuments, Listed Buildings, Inventory status Gardens and Designed Landscapes, Inventory status Historic Battlefields, World Heritage Sites and Conservation Areas;
- The West of Scotland Archaeology Service (WOSAS) Historic Environment Record (HER), a digital database extract (obtained in August 2016);

- The Online Historic Environment Scotland database (Canmore) (HES 2018b): provided information additional to that contained in the HER;
- Ordnance Survey maps (principally 1st and 2nd edition) and other published historic maps held by the Map Library of the National Library of Scotland;
- Available on-line modern aerial photographs (GoogleEarth™ and Bing Maps™);
- The on-line Historic Land-Use Assessment Data for Scotland (HLAmap) (HES 2018c) was consulted for information on the historic land-use character across the study area;
- The Scottish Palaeoecological Archive Database (SPAD, Coles et al 1998): records the distribution of known sites across Scotland, was consulted for information on sites with palaeoenvironmental and palaeoecological potential; and
- Relevant bibliographic sources and online historic resources (including Carter 1993).

Outer Study Area

The 'Bare-Earth' Zone of Theoretical Visibility (ZTV) map generated for the proposed development was used to identify those designated assets within the Outer Study Area that would have theoretical visibility of the proposed development.

Up-to-date information was obtained from HES and WoSAS for heritage assets with statutory and non-statutory designations within the Outer Study Area and within the ZTV.

6.2.4 Field Survey

A walk-over field survey was carried out within the Inner Study Area. The field survey was carried out on 10-13 July 2017.

The field survey was carried out with the following aims:

- To assess the baseline conditions of the known heritage assets identified by the desk-based study;
- To identify any further features of heritage interest not detected from the desk-based study;
- To assess the potential for the Inner Study Area to contain currently unrecorded, buried archaeological remains; and
- To assess the potential effect of the proposed construction works on identified assets.

No intrusive archaeological interventions have been carried out as part of this assessment.

Identified heritage assets were recorded on pro-forma monument recording forms and by digital photography, and their positions (and where appropriate extents) were logged using a Global Positioning System (GPS).

A gazetteer of heritage assets identified within the Inner Study Area is provided in Technical Appendix 6.1, and their locations and extents are shown on Figure 6.1.

6.2.5 Assessment of Effects

Potential impacts were identified within the following categories:

- Construction (direct) impacts: where there may be a physical impact on a heritage asset caused by construction of the proposed development; and
- Operational (indirect) impacts: where the setting of a heritage asset may be affected as a result of the construction and operation of the proposed development.

To inform the appraisal, the sensitivity of each heritage asset has been determined from the relative weight given to it in Scottish Planning Policy (SPP) (Scottish Government 2014) and Historic Environment Scotland Policy Statement (HESPS) (Historic Environment Scotland 2016).

Table 6.1 summarises the relative sensitivity of those heritage assets relevant in the context of this assessment.

Table 6.1: Sensitivity of Heritage Assets	
Sensitivity of Asset	Definition / Criteria
High	Sites of national importance, including: <ul style="list-style-type: none"> • Scheduled Monuments and sites proposed for scheduling • Category A Listed Buildings • Inventory Gardens and Designed Landscapes
Medium	Sites of regional importance, including: <ul style="list-style-type: none"> • Archaeological sites and areas of distinctive regional importance • Category B Listed Buildings • Conservation Areas
Low	Sites of local importance, including: <ul style="list-style-type: none"> • Archaeological sites of local importance • Category C Listed Buildings • Unlisted buildings with local (vernacular) characteristics
Negligible	Sites of little or no importance, including: <ul style="list-style-type: none"> • Artefact find-spots • Unlisted buildings of minor historic or architectural interest • Poorly preserved examples of particular types of feature
Unknown	Sites and features where there is insufficient baseline information to determine more reliably the relative importance of the identified feature.

6.3 Baseline Conditions

Inner Study Area

A total of 56 heritage assets have been identified within the Inner Study Area. Appendix 6.1 contains a full gazetteer description of each of these assets. Their locations and extents are shown on Figure 6.1.

The landscape within the Inner Study Area includes a number of heritage assets primarily relating to medieval and post-medieval rural settlement and agricultural use of the landscape.

There are no heritage assets with statutory designations (Scheduled Monuments, Listed Buildings, Conservation Areas) within the Inner Study Area, and the Inner Study Area does not intersect any Inventory status Gardens and Designed Landscapes, Inventory status Historic Battlefields or World Heritage Sites.

Numbers in brackets and in bold in the following text, refer to asset numbers provided on Figure 6.1. A detailed description of the baseline condition of each heritage asset within the Inner Study Area is provided in Appendix 6.1.

Medieval/ Post Medieval Agricultural Remains

The remnants of several areas of former field systems, rig and furrow cultivation remains, field banks and tumbled field walls (**16, 19, 20, 21, 26, 28, 29, 36, 37, 38, 49** and **52**) were recorded by the field survey; three (**53-55**) were identified from examination of modern aerial photography. One field bank (**40**) of larger size may be best understood as a head dyke, a bank formerly marking the edge of the regularly cultivated infield land. These remains, relating to the former agricultural use of the land within the Inner Study Area, are all considered to have a low sensitivity to change.

Two clearance cairns (**33** and **39**), which were recorded at the edge of improved pasture fields within the Inner Study Area, are believed to be the result of recent agricultural improvement of the land and are considered to have a negligible sensitivity to change.

The remains of a trackway (**25**) which is marked on the First Edition Ordnance Survey map (1858), and identified by the field survey, is considered to have a negligible sensitivity to change.

The dwelling of Tralodden (**3**) is shown on the First Edition Ordnance Survey map (1858), and continues to be occupied today. The house is considered to have a low sensitivity to change.

The building of Glenassel Lodge (**5**) is shown on the First Edition Ordnance Survey map (1858), and has recently been subject to restoration. To its immediate east are the remains of small building and enclosure which formed kennels (**6**). Further south are the farmsteads of Tramitchell (**8**) and Daldowie (**24**), both of which are shown on the First Edition Ordnance Survey map (1858), and continue to be occupied today. All of these buildings are considered to have a low sensitivity to change.

The remains of a building (**48**), surviving as a low turf-covered bank, identified by the field survey, are of uncertain date. They are considered to have a low sensitivity to change.

No upstanding remains of Tormitchell Lodge (**7**), or of Balligmorrie Cottage (**35**), which are shown on the First Edition Ordnance Survey map (1858), were recorded by the field survey. The former locations of the lodge and cottage are considered to have a negligible sensitivity to change.

The location of the remnants of the non-inventory designed landscape of Tormitchell (**9**) is recorded by the HER. Field survey recorded the remnants of woodland plantation belts situated within dry-stone walled enclosures. The remnants of the designed landscape are considered to have a low sensitivity to change.

The farmstead of Garleffin (**51**) which is marked on the First Edition Ordnance Survey map (1858) survives in a ruinous condition, with the remains of an enclosure surviving to the north of the buildings of the farmstead. The remains of the buildings and surrounding enclosures of the farmstead are considered to have a low sensitivity to change.

Medieval / Post Medieval Industrial Features

A Kiln house and Guild Hall (**10**) are marked on the First Edition Ordnance Survey map (1858). Their location lies within the modern Tormitchell Quarry and so they could not be visited by the field survey. The remains are considered to be of unknown, but no more than low sensitivity to change.

Remnants of a tramway leading from Tormitchell Quarry (**12**), survive in a grass-covered condition. The remains of the former tramway are considered to have a negligible sensitivity to change.

A former road (**13**) also runs in a south-westerly direction from Tormitchell Quarry. No upstanding remains of the road survive within the Inner Study Area, and it is considered to have a negligible sensitivity to change.

A lime kiln (**32**) which is shown on the First Edition Ordnance Survey map (1858) survives in good condition, immediately to the east of a limestone quarry. A further lime kiln (**34**) survives in a turf-covered condition further to the south. The remains of both kilns are considered to have a low sensitivity to change.

Miscellaneous features

A number of quarries (**1, 2, 17, 18, 22, 23, 27, 31, 41, 46** and **47**) and gravel pits (**4, 42, 43, 45** and **50**) were recorded throughout the Inner Study Area. These were likely used to gather

material to build local buildings, walls and roads. The quarries and gravel pits are all considered to have a negligible sensitivity to change.

A well (**11**) which was confirmed by the field survey to be a natural spring, and a mineral spring (**15**), both of which are shown on the First Edition Ordnance Survey map (1858) are considered to have a negligible sensitivity to change.

The former location of a wooden footbridge (**14**) is considered to have a negligible sensitivity to change.

A worked stone (**30**) situated on the top of a field bank is of uncertain origin and function. The stone is considered to have a negligible sensitivity to change.

A stone marked with a benchmark (**44**) was recorded by the field survey. It is considered to have a low sensitivity to change.

A parish boundary (**56**), of probable 18th century date, is recorded in the HER and is considered to have a low sensitivity to change.

Archaeological Potential of the Inner Study Area

The current land use of the Inner Study Area is predominantly farmland or rough pasture, with an area of forestry plantation towards the northern end of the proposed development.

There is no firm evidence for prehistoric activity within the Inner Study Area. Within the vicinity of the proposed development, recorded archaeological remains of likely prehistoric date are largely restricted to remains of cairns, situated on more elevated land and hill summits.

Settlement in the area is first depicted in detail on Roy's Military Survey (1747 -55). Many of the farmsteads which remain today bear the same names, indicating the continuing use of the area for agricultural activity, which was focussed along the valleys of the Water of Assel and the River Stinchar. In these areas the long period of agricultural use of the land, is likely to have resulted in a decreased probability of surviving upstanding archaeological remains, and thus the limited number of visible archaeological remains in these areas cannot necessarily be taken as an indication that no buried archaeological remains are present.

The remainder of the area is shown on Roy's Military Survey, as today, as unimproved land, within which it would be expected that archaeological remains would survive as upstanding remains which would be identified by the field survey. The field survey recorded only limited areas of archaeological remains, primarily relating to former agricultural exploitation of the land.

Within the small area of woodland plantation within the Inner Study Area, forestry ploughing is likely to have caused considerable disturbance to any archaeological remains, and it is therefore considered that within this area there is a low potential for the discovery of previously unknown buried archaeological remains.

Overall, taking into account the current land use of the Inner Study Area, the limited areas of archaeological remains recorded by the field survey, and the limited areas of ground disturbance which would be required for the proposed development, it is considered that overall there is a low probability for the discovery of presently unknown buried archaeological remains during the construction of the proposed development.

Outer Study Area

There are seven designated heritage assets located within 3 km of the northern part of the proposed OHL from which one or more element of the proposed OHL would theoretically be visible (Figure 6.2). These assets are listed in Appendix 6.2, and include a medieval motte, a Castle, and a garden and designed landscape laid out by W.S. Gilpin.

6.4 Potential Impacts and Mitigation

6.4.1 Construction

Ground breaking activities associated with construction of the proposed development (OHL or underground cable) have the potential to disturb or destroy the remains of heritage assets known to be present within the proposed development area and on any hitherto undiscovered buried remains of archaeological interest that might also be present. Other construction activities, such as vehicle movements, storage of construction materials, and landscaping, also have the potential to cause direct, permanent and irreversible impacts on the cultural heritage.

A 50 m Limit of Deviation (LoD) (25m either side of the proposed development) has been defined to allow the micrositing of wood pole locations and the underground cable in order to avoid environmental or physical features as required. The following assessment therefore assumes the possibility that any heritage asset within the LoD (Figure 6.1) could, without mitigation, be directly impacted by the proposed development.

Proposed access routes for the OHL section of the proposed development (north of pole position 33) are shown on Figure 6.1. No ground breaking or track construction will be required for access provision within this area, as low ground pressure vehicles will be used during construction works. For the southern part of the underground cable section of the proposed development (between the Muck Water and Mark Hill substation), temporary 3 m wide floating stone tracks will need to be constructed. The track would be adjacent to the underground cable route, on its eastern side (Figure 6.1).

No mitigation is considered necessary for assets of negligible sensitivity to change, and therefore assets of negligible sensitivity within the LoD are not mentioned further.

There is potential for direct impacts on 14 assets of low sensitivity within the LoD to occur during the construction phase. Generic, appropriate mitigation measures to reduce or off-set these impacts are detailed in Table 6.2. These mitigation measures will be defined in full detail in a Written Scheme of Investigation (WSI) prepared in response to any archaeological planning condition imposed by the Council.

6.4.2 Operation

The presence of the proposed development could result in potentially adverse impacts on the setting of heritage assets present in the surrounding landscape. Potential impacts are detailed in Technical Appendix 6.2 and summarised below in Table 6.3.

The southern part of the proposed development comprises an underground cable. This part of the proposed development will not be visible, and will not therefore have any effect upon the setting of heritage assets in the wider landscape.

No potentially significant operational effects (effects upon the setting of heritage assets) have been predicted as a result of the proposed development. No mitigation is considered necessary to offset potential operational effects.

Table 6.2: Potential Impacts on Cultural Heritage during Construction and Relevant Mitigation/Control Measures		
Potential Impact	Receptor	Mitigation/Control Measures Proposed
Assets within the 50 m LoD for the proposed development where construction works for the proposed development could disturb the asset.	Asset 16: Field system and rig and furrow cultivation remains Asset 19(a): Field bank Asset 20: Field system Asset 26: Field system Asset 28: Field bank Asset 29: Field bank Asset 36(b): Field bank Asset 37: Field bank Asset 38: Field bank Asset 40: Field bank / Head dyke Asset 44: Ordnance Survey benchmark Asset 54: Enclosure; Field Asset 55: Field bank	Detailed mitigation measures will be set out in a Written Scheme of Investigation (WSI) in response to any archaeological planning condition imposed by South Ayrshire Council. The WSI be developed through consultation with WoSAS, acting on behalf of the Council, and will be implemented ahead of commencement of the construction works. Where possible microsite the proposed development to avoid direct impacts on identified assets. Mark-off assets during construction works, to ensure preservation in situ. Assets that cannot be avoided should be investigated and recorded prior to / during construction works. Archaeological investigations would be carried out to a specification and standard to be agreed in writing with South Ayrshire Council through consultation with WoSAS.
Access routes for use during construction causing a direct impact on cultural heritage assets.	Asset 1: Trackway Asset 20: Field system Asset 26: Field system Asset 28: Field bank Asset 29: Field bank Asset 36(a): Field bank Asset 36(b): Field bank Asset 38: Field bank Asset 40: Field bank / Head dyke Asset 44: Ordnance Survey benchmark Asset 54: Enclosure; Field Asset 55: Field bank	Detailed mitigation measures will be set out in a Written Scheme of Investigation (WSI) in response to any archaeological planning condition imposed by South Ayrshire Council. The WSI be developed through consultation with WoSAS, acting on behalf of the Council, and will be implemented ahead of commencement of the construction works. Where possible microsite the proposed development to avoid direct impacts on asset. Where linear assets (such as banks and walls) survive as upstanding features, access tracks would be routed through any existing gates or broken (less well preserved) sections where possible. Mark-off asset during construction works, to ensure preservation in situ Assets that cannot be avoided should be investigated and recorded prior to / during construction works. Archaeological investigations would be carried out to a specification and standard to be agreed in writing with South Ayrshire Council through consultation with WoSAS.

Table 6.2: Potential Impacts on Cultural Heritage during Construction and Relevant Mitigation/Control Measures		
Potential Impact	Receptor	Mitigation/Control Measures Proposed
Direct impact on unknown cultural heritage features within areas of forestry plantation (which were not covered by the field survey)	Unknown	No mitigation necessary. The area was surveyed in advance of the planting of the forestry in 1993 (Carter & Dalland 1993).
Direct impact on buried archaeological remains	Unknown. Low potential for presently unknown buried archaeological remains to survive within areas of ground disturbance associated with the proposed development.	Any requirement for archaeological monitoring works/watching briefs during the construction phase would be agreed in consultation with West of Scotland Archaeology Service (WoSAS) advisors to South Ayrshire Council. Detailed mitigation measures will be set out in a Written Scheme of Investigation (WSI) in response to any archaeological planning condition imposed by South Ayrshire Council, and will be implemented ahead of commencement of the construction works. If significant discoveries are made during archaeological monitoring and preservation in situ is not possible, provision would be made for an appropriate amount of investigation and recording to be agreed in writing with South Ayrshire Council through consultation with WoSAS. That provision would include the consequent production of written reports on the findings, with post-excavation analyses and publication of the results of the work where appropriate.

6.4.3 Operation

Potential effects during operation are detailed in Table 6.3 below, which also details the relevant receptor and mitigation or control measures, where appropriate.

Table 6.3: Potential Impacts on Cultural Heritage during Operation and Relevant Mitigation/Control Measures		
Potential Impact	Receptor	Mitigation/Control Measures Proposed
Operational Impact (Impact on the setting) of designated heritage assets within the Outer Study Area	One Scheduled Monument One Category A Listed Building One Inventory Garden and Designed Landscape Three Category B Listed Buildings One Category C Listed Building	No mitigation recommended.

TECHNICAL APPENDIX 6 – CULTURAL HERITAGE APPRAISAL

- 6.1: Cultural Heritage Assets within the Inner Study Area
- 6.2: Cultural Heritage Assets within the Outer Study Area with predicted visibility of the Proposed Development
- 6.3 List of Sources Consulted

TECHNICAL APPENDIX 6.1: CULTURAL HERITAGE ASSETS WITHIN THE INNER STUDY AREA

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
1	<i>Old Quarry (Whinstone), Trackways</i>	N/A	222750	596432	Historic maps; Field survey	<p>The Ordnance Survey First Edition map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks an 'Old Quarry (Whinstone)' at 222750, 596432. A trackway connects the quarry with the farmstead of Tralodden to the south. The Trackway also extends to the north of the quarry with two branches of trackway leading to the north and west.</p> <p>Field survey found the quarry and trackway as marked on the First Edition map. The quarry was approximately 2.5 m deep and survived in a turf covered condition. The trackway survives as a shallow, grass-covered holloway, approximately 2 m wide and between 0.3 and 0.4 m deep.</p>	Negligible
2	<i>Old Quarry (Whinstone)</i>	N/A	222797	596318	Historic maps; Field survey	<p>The Ordnance Survey First Edition map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks an 'Old Quarry (Whinstone)' at this location.</p> <p>Field survey found the quarry to be between 2.5 m and 3 m deep, surviving in a turf-covered condition.</p>	Negligible
3	<i>Tralodden / Tralodden Cottage</i>	N/A	222728	596258	Historic maps; Field survey	<p>The Ordnance Survey First Edition map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks 'Tralodden' at this location. It comprises a square range of buildings enclosing a courtyard, with an opening on its south-eastern side. A small additional square building is marked to the north of the buildings within an irregular shaped enclosure.</p> <p>Tralodden Cottage is an occupied dwelling house, the square range of buildings surviving, albeit with the northern range currently in unroofed condition. The square building appears to no longer be present.</p>	Low
4	<i>Gravel Pit</i>	N/A	222950	595120	Historic maps; Field survey	<p>The Ordnance Survey First Edition map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks a 'Gravel Pit' at this location on the eastern side of the road.</p>	Negligible

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						Field survey identified the gravel pit, visible as a slight turf-covered hollow, no more than 0.2 m deep adjacent to the road.	
5	<i>Building; Glenassel Lodge</i>	N/A	222971	595037	Historic maps; Field survey	An unnamed rectangular building is marked at this location, to the immediate west of the road, on the First Edition Ordnance Survey map (1858, Ayrshire, Sheet LVI, 6" to 1 mile). Field survey found that the building, named Glenassel Lodge, has been recently restored. It comprises a two-storey harled building. A modern garage of breeze-block construction has been added to the north-west of the building.	Low
6	<i>Kennels</i>	N/A	595044	222996	Historic maps; Field survey	A rectangular building situated at the north-eastern edge of a small square enclosure and labelled 'Kennels' is shown at this location on the 1909 Ordnance Survey map (Ayrshire, Sheet 056.10, 25" to 1 mile). The single-storey building remains today in a roofed, but unused condition, and is overgrown with scrubby trees.	Low
7	<i>Tormitchell Lodge; Building</i>	N/A	223050	594997	Historic maps; Field survey	An unnamed rectangular building is marked at this location, to the east of the road, on the First Edition Ordnance Survey map (1858, Ayrshire, Sheet LVI, 6" to 1 mile). A small enclosed area of gardens is situated between the building and road. The building is named on later maps (Ordnance Survey, 1909, Ayrshire, Sheet 056.10, 25" to 1 mile) as Tormitchell Lodge. No remains of the building or enclosure are visible on modern aerial photography (Google Earth 2017). Field survey found no trace of the building.	Negligible
8	<i>Tramitchell; Farmstead</i>	N/A	223032	594610	Historic maps; Aerial photography; Field survey	The First Edition Ordnance Survey map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks three buildings at this location, named 'Tramitchell'. 8a – a rectangular building aligned north-east to south-west adjacent to the road. This building is no longer present on modern aerial photography (Google Earth 2017), and no trace of it was	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						<p>identified by the field survey.</p> <p>8b - a long range of buildings aligned roughly north-south. Field survey found that this building remains today, although it has been shortened at its southern end. It is of stone construction with white harling, and, has a corrugated iron roof.</p> <p>8c - A short rectangular building aligned approximately east to west is situated immediately to the south of building 8b. It has a modern corrugated iron building attached to its northern side.</p> <p>The 1896 edition of the Ordnance Survey map (Ayrshire, Sheet 056.10, 25" to 1 mile) marks an additional building to the south-west. This building, the farmhouse, lies just outwith the survey corridor.</p>	
9	<i>Tormitchell; Designed Landscape – map evidence</i>	53518	223100	594500	Non-Inventory Garden and Designed Landscape; Field survey	<p>The HER records the location of the remnants of a non-inventory designed landscape at Tormitchell. The place name of Tormitchell is known from Blaeu's map 'The northpart of Carrick' (1654) which shows a substantial building at Tormitchell. Roy's Military Survey map (1747-55) shows the settlement of 'Permittchell', but, provides no indication that it is situated within a designed landscape.</p> <p>The Ordnance Survey First Edition Map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks a series of broad woodland strips to the north-east of Tormitchell House, one with a north-south axis, and three offsets from this to east and west. They appear to be woodland belts associated with the improvement of the landscape for agricultural purposes, rather than part of a former area of gardens and designed landscape. More recent maps show what appears to be a progressive decline and fragmentation of the woodland.</p> <p>Field survey found that remnants of the woodland belts survive, in plantation areas enclosed within dry-stone walls.</p>	Low
10	<i>Kiln House; Guild Hall</i>	N/A	223161	594354	Historic maps	<p>The First Edition Ordnance Survey map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks a rectangular building aligned approximately north to south at this location. It is shown on the</p>	Unknown (Low)

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						<p>25" map as being comprised of two halves, the northern part comprising a Kiln House and the southern part a Guild Hall.</p> <p>Due to the active quarry in this area it was not possible to access this location during the field survey, and the current condition of this building is unknown.</p>	
11	Well	N/A	594343	223102	Historic maps; Field survey	<p>The First Edition Ordnance Survey map (1858, Ayrshire, Sheet LVI, 6" to 1 mile) marks a well at this location.</p> <p>Field survey found a natural spring at this location.</p>	Negligible
12	Tormitchell; Tramway	12572; Canmore ID. 74241	223506 221749	594401 593583	HER; Canmore; Historic maps; Field survey	<p>The Second Edition Ordnance Survey map (1896, Ayrshire, Sheet LVI.SW, 6" to 1 mile shows the route of a tramway. It runs to the south-west from Tormitchell Quarry towards the road, and then runs adjacent to the road. The length of tramway recorded in the HER runs from 223506 594401 to 221749 593583.</p> <p>The HER records that a length of c.150 m of embankment was recorded by an archaeological field survey in 1993 (Carter 1993). The tramway was recorded as being 3 m wide, and, crossing the Barbae Burn on wooden bridge which survived only as wooden piles and broken upright timbers.</p> <p>The current field survey found the surviving remains of the same short section of the tramway (the surviving part is shown as a solid line on Figure 1, and the remainder of the former tramway marked as a dotted line) and runs between approximately NGR 223067 to 222867 594135). The tramway is up to 3 m wide and 1 m high. The tramway is now in use as a public footpath. It survives in grass-covered, overgrown condition. To the south-west of the property of Burnside, no trace of the tramway was found; the course of the tramway here followed the course of the road, and it is assumed any remains of it have been lost during road widening etc.</p>	Negligible
13	Tormitchell; Road	12573	223506 221749	594401 593583	HER; Historic maps; Field	<p>The HER record the course of a 19th century road or trackway which runs in a south-westerly direction from Tormitchell Quarry.</p>	Negligible

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
					survey	<p>The road is shown on the First Edition Ordnance Survey map (1858, Ayrshire, Sheet LVI, 6" to 1 mile), and runs from 223506 594401 to 221749 593583, from which point it continues to run in a south-westerly direction.</p> <p>A field survey in 1993 (Carter 1993) found the roadway to be between 2.5 m and 3 m in width, and recorded that it could be traced for much of its length. The survey recorded that the road had been engineered to provide uniform shallow gradients. It recorded the presence of ditches associated with the road in poorly drained areas, and the presence of small quarries adjacent to the road at intervals along its course. Some limited evidence of metalling (using small angular rubble) was recorded. The roadway was found to have been washed away at locations where it crosses streams and gullies, and no original bridges or culverts were located.</p> <p>The current field survey found that no trace of this road survives within the survey corridor, due to the disturbance caused by the modern Tormitchell Quarry. A linear clearing in the woodland plantation follows the course of this former road, and remains of it may survive outwith the Inner Study Area for this project.</p>	
14	<i>Footbridge</i>	N/A	594105	222830	Historic maps; Field survey	A footbridge (wood) is marked at this location on the Ordnance Survey First Edition map (1858, Ayrshire, Sheet LVI, 6" to 1 mile). Field survey found no remains of this footbridge.	Negligible
15	<i>Mineral Spring</i>	N/A	594064	222851	Historic maps; Field survey	A mineral spring is marked at this location on the Ordnance Survey First Edition map (1858, Ayrshire, Sheet LVI, 6" to 1 mile). Field survey found a wet hollow at this location, measuring about 3 m in diameter, and now connected into a wider system of drainage.	Negligible
16	<i>Field System; Rig and furrow cultivation</i>	N/A	222092	593458	Aerial Photography (Bing TM);	The northern part of a field system, which extends further to the south (outside the survey area) is visible on modern aerial photography (Bing TM).	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
	<i>remains;</i>				Field survey	<p>Field survey recorded the field survey, the following elements of which lie within the survey area:</p> <p>16a – sub-square enclosure, enclosed by a turf-covered bank approximately 2 m wide and 0.7 m high. Within the enclosure are well-preserved rig and furrow cultivation remains, with a wavelength of 2.5 m, and surviving to a maximum height of 0.4 m.</p> <p>16b – two lengths of turf-covered field bank, approximately 2 m wide and 0.7 m high.</p> <p>16c, 16d and 16e – three lengths of turf-covered field bank, measuring approximately 2 m wide, and up to 0.6 m high.</p> <p>16f – a turf-covered clearance cairn measuring approximately 6 m x 4 m and up to 0.5 m high.</p> <p>16g – a turf-covered clearance cairn measuring approximately 5 m in diameter and up to 0.7 m high.</p> <p>16h – a length of turf-covered field bank approximately 2 m wide and 0.4 m high.</p> <p>Two areas of rig and furrow cultivation remains (16j & 16i) are visible on modern aerial photography (Bing TM). The rig and furrow could not be seen during the field survey, due to high vegetation.</p>	
17	<i>Quarry</i>	N/A	221916	593337	Historic maps; Field survey	<p>An 'Old Quarry (Whinstone)' is marked at this location on the Ordnance Survey First Edition map (1858 Ayrshire, Sheet LVI, 6" to 1 mile).</p> <p>Field survey found the quarry, which was approximately 2 m deep, surviving in turf-covered condition.</p>	Negligible
18	<i>Quarry</i>	N/A	221799	593306	Field survey	<p>Field survey found a quarry, surviving in turf-covered condition. The quarry measures approximately 12 m x 16 m and is 2.5 m deep.</p>	Negligible
19	<i>Field banks</i>	N/A	221477	593394	Field survey	<p>Field survey recorded the fragmentary remains of a field bank, of</p>	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
			221532 221552 221598	593303 593392 593386		<p>which four lengths were recorded.</p> <p>The two best preserved parts of the bank (19a) were approximately 2 m wide and up to 0.5 m high and survive to the immediate north of a modern post and wire fence and tree-lined boundary. These lengths of bank run between 221477 593394 to 221532 593303.</p> <p>Further to the north-east two less well-preserved lengths of bank (19b) approximately 2 m wide and 0.4 m high were recorded situated at the edge of the higher ground, before it forms an abrupt slope down to the Assel Water river. These lengths of bank run between 221552 593392 to 221573 593385 and between 221598 593386 to 221635 593403.</p>	
20	Field system	N/A	221437 (centred)	592974 (centred)	Aerial photography; Field survey	<p>A field system comprising several fields enclosed by turf-covered banks is visible on modern aerial photography (Bing TM) in this area, to the north-east of Daldowie Farm. Some of the field banks have been added to modern OS mapping.</p> <p>Field survey found the banks surviving in a variety of conditions. The main boundary within the study area which runs in a generally north-east to south-west alignment has been recently reinforced as a double line of post and wire fencing with a central ditch. This alignment generally follows the earlier field bank visible on the aerial photography. Towards its southern end the modern bank deviates from the course of the earlier bank. The earlier bank remains on the eastern side of the modern bank, measuring approximately 1 m wide and 0.6 m high.</p> <p>The other banks of the field system are approximately 2 m wide and up to 0.4 m wide, surviving in a turf-covered condition.</p> <p>At the southern end (221383 592818) of the field system the remnants of two small enclosures or pens (20a) were found, surviving as turf-covered banks approximately 1.2 m wide and up to 0.3 m high.</p> <p>Faint traces of rig and furrow cultivation remains are visible within</p>	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						the field system on modern aerial photography (Bing TM) but could not be traced during the field survey.	
21	<i>Field bank</i>	N/A	221409	593078	Field survey	Field survey found a field bank, approximately 20 m long. The turf-covered bank is approximately 2 m wide and 0.4 m high, and runs in a generally north-east to south-west direction, curving to the west at its south-western end.	Low
22	<i>Quarry</i>	N/A	221373	592914	Field survey	Field survey identified a small quarry surviving in a turf-covered condition. The circular quarry measured c. 6 m in diameter and was up to 3 m deep.	Negligible
23	<i>Quarry</i>	N/A	221351	592862	Historic maps; Field Survey	A Whinstone Quarry is marked at this location on the Ordnance Survey First Edition map (1858 Ayrshire, Sheet LVI, 6" to 1 mile). The 1909 Edition of the Ordnance Survey map describes the feature as an 'Old Quarry' indicating that it was out of use by that date. Field survey recorded the quarry surviving as a turf-covered hollow approximately 3 m deep. The quarry hollow measured approximately 13 m x 18 m internally.	Negligible
24	<i>Daldowie; Farmstead</i>	N/A	221059	592504	Historic maps; Field survey	A farm named as 'Daldowie' is shown on the First Edition Ordnance Survey map (1858. Ayrshire, Sheet LXII, 6" to 1 mile). Daldowie comprises a rectangular building orientated north-west to south-east with an L-shaped range of buildings to the southwest, including a horse engine on the southern side. A small square building is marked to the north-west of this range of buildings and two other small rectangular buildings are marked further to the south. The farm remains occupied today.	Low
25	<i>Trackway</i>	N/A	220599 221612	592417 591894	HER; Field survey	A trackway is marked on the Ordnance Survey First Edition map (1858. Ayrshire, Sheet LXII, 6" to 1 mile). Within the western part of the survey area no remains of the trackway could be seen. Within the eastern part of the survey	Negligible

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						area the trackway is visible as a narrow holloway, with a boggy base, approximately 1.5 m wide and enclosed on either side by banks forming part of field system (26). The surviving piece of trackway runs between 221292 592072 and 221612 591894.	
26	Field system	N/A	221373 (centre)	591994 (centre)	Aerial photography; Field survey	Field survey identified the edge of a field system, which extends outside the survey area to the north-west. The wider field system is visible on aerial photography (Bing TM). Field survey found two parallel lengths of bank at the southern edge of the field system, with the trackway (25) running between them. The southernmost bank survives in turf-covered condition and is up to 2 m wide and 0.7 m high. The northern bank is in a similar turf-covered condition but is smaller, measuring approximately 1 m wide and 0.4 m high.	Low
27	Quarries (Whinstone)	N/A	221298	591872	Historic maps; Field survey	The Ordnance Survey First Edition map (1858. Ayrshire, Sheet LXII, 6" to 1 mile) marks two Whinstone Quarries (27a & 27b). Field survey found that quarry 27a (at 221298 591872) has been extended, with the original quarry surviving as a small turf-covered hollow approximately 1 m deep, at the southern end of the overall quarry area. The larger modern quarry is approximately 3 m deep. Quarry 27b is situated further to the south-east (at 221328 591807). The quarry survives in turf-covered condition, and, is now occupied by a water tank of brick and concrete construction.	Negligible
28	Field bank	N/A	221221	591606	Historic maps; Field survey	A field bank is marked within a woodland plantation on the Ordnance Survey First Edition map (1858. Ayrshire, Sheet LXII, 6" to 1 mile). Field survey identified the bank which survives within the woodland plantation, and, is now overgrown with mature grass. The bank is 3 m wide and survives to a height of approximately 0.7 m.	Low
29	Field bank	N/A	221256	591589	Field survey	Field survey identified a bank surviving within a woodland	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						plantation. The bank is turf-covered and is approximately 3 m wide and up to 0.7 m high.	
30	<i>Worked stone</i>	N/A	591618	221175	Field survey	Field survey identified a worked stone situated on top of field bank 28 . The rock has three large circular hollows: The one at the north-western end of the rock is c.10 cm in diameter and 3 cm deep. The central hollow is c. 10 cm in diameter and 4 cm deep. The hollow at the south-eastern end of the rock is c. 10 cm in diameter and 5 cm deep. The hollows appear to be too deep to be cupmarks, but appear to be of anthropogenic, rather than natural origin. The stone maybe reused from another location, and, may have functioned as a pivot stone or similar.	Negligible
31	<i>Quarry; Trackway</i>	N/A	221163	591423	Historic maps; Field survey	The Ordnance Survey First Edition map (1858. Ayrshire, Sheet LXII, 6" to 1 mile) marks a Whinstone Quarry at this location, situated to the immediate west of a trackway. Field survey found no remains of the trackway. The quarry survives as a small turf-covered hollow approximately 0.7 m deep.	Negligible
32	<i>Kilpatrick; Lime Kiln; Limestone Quarries</i>	53149	221232	591214	HER; Historic maps; Field survey	A limekiln is depicted at this location on the First Edition Ordnance Survey map (1858. Ayrshire, Sheet LXII, 6" to 1 mile). The limekiln is marked immediately to the east of a Limestone Quarry. The 1909 Edition of the Ordnance Survey map describes the features as 'Old Limekiln' and 'Old Quarries' indicating that they had fallen out of use by this date. The HER describe the kiln as a substantial stone-built structure projecting from an earth mound or hill slope, presumably to allow the kiln to be loaded from the top. A large stone lintel is visible over the drawn arch at the base of the kiln, with apparent secondary brick infill within this arch.	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						<p>Field survey found the lime kiln to survive in good condition, conforming to the description held by the HER. The quarry survives in an overgrown state.</p> <p>Two further limestone quarries are marked to the south-west on the First Edition Ordnance Survey map, outside the study corridor, at NGR 221127, 591129 and NGR 221233, 591227.</p>	
33	<i>Clearance cairns</i>	N/A	221613	590672	Field survey	<p>Field survey identified a string of clearance cairns situated at the edge of the flat part of an improved field, at the break of slope where land falls away sharply towards the River Stinchar.</p> <p>All four clearance cairns (32 a- d) are of similar character, partially turf-covered and up to 0.4 m high. They contain stones up to 0.3 m in length. The positioning of the clearance cairns at the edge of an improved area of land suggests that they date to the improvement period, rather than being of prehistoric origin, and hence they are considered to be of negligible sensitivity.</p>	Negligible
34	<i>Lime kiln</i>	N/A	221589	590617	Field survey	<p>Field survey identified a lime kiln surviving in a turf-covered condition. The lime kiln is situated at the edge of an improved field and at the break of slope where land falls away sharply towards the River Stinchar.</p> <p>The walls of the lime kiln are between 0.6 m and 1 m in width, and, survive to a height of 0.3 m above the ground surface. The interior of the kiln has been partially filled with clearance material, the interior of the kiln is currently 0.7 m deep.</p>	Low
35	<i>Balligmorrie Cottage; Farmstead (possible)</i>	42421; Canmore ID 170553	221630	590610	HER; Canmore; Historic maps; Field survey	<p>The First Edition Ordnance Survey map (1858. Ayrshire, Sheet LXII, 6" to 1 mile) marks a single rectangular unroofed building, aligned approximately north-east to south-west and labelled 'Ruin'. A cluster of trees are marked to the west of the building, and a row of three trees (running north to south) are situated to the south-east of the building. The building is not marked on the 1894 edition of the Ordnance Survey map.</p> <p>Field survey found no remains of the cottage, the former location</p>	Negligible

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						of which is now at the centre of a field of improved pasture.	
36	Field bank	N/A	221643 221657	590689 590460	Field survey	<p>Field survey identified several lengths of turf-covered field bank. They follow the same course as the modern stone-built field boundaries, but, are situated in the interior of the modern field boundaries.</p> <p>Field bank 36a is approximately 1.5 m wide and 0.3 m high. The bank runs along the banks of a burn, at the edge of what is now a field of improved pasture. The bank survives in a turf-covered condition, but some stone content is visible. The bank runs between 221643 590689 and 221782 590575.</p> <p>Field bank 36b is approximately 0.7 m high and up to 2 m wide. The bank survives in a turf-covered condition, but some stone content is visible. The bank lies to the immediate north of a more recent field hedge. The bank runs between 221780 590569 221657 590460.</p>	Low
37	Field bank	N/A	221695 221824	590695 590324	Field survey	<p>Field survey recorded a turf-covered field bank running down the edge of a modern field. The bank measures approximately 1.5 m in width and is 0.6 m high. The stone content of the field bank can be seen at some locations where the turf has been worn away.</p> <p>A modern hedge and post and wire fence is situated to the immediate south-west of the field bank.</p>	Low
38	Field bank	N/A	221947 222164	590026 590016	Aerial photography; Field survey	<p>Field survey recorded a turf-covered field bank. The eastern part of the field bank is best preserved and comprises a turf-covered bank approximately 3 m wide and up to 0.7 m high. At its western end the bank becomes more difficult to follow and comprises a spread of stone up to 4 m wide.</p> <p>The course of the bank can be seen on modern aerial photography (Bing TM).</p>	Low
39	Clearance cairn	N/A	221991	589797	Field survey	<p>Field survey identified a clearance cairn situated on the edge of an improved field where the field slopes sharply downwards towards the burn. The clearance cairn was approximately 0.2 m high.</p>	Negligible

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
						The position of the clearance cairn at the edge of an improved field suggests that it dates to the improvement period, rather than being of prehistoric origin, and hence it is considered to be of negligible sensitivity.	
40	Field bank / Head dyke	N/A	222235	589637	Field survey; Aerial photography	Field survey identified a length of field bank between 1 and 1.5 m high and up to 3 m wide. The bank survives in turf-covered condition with occasional stones visible. The bank extends to the north-east outwith the survey area. Its size and the length for which it runs suggests that it may be best understood as a head dyke (a bank formerly marking the edge of the regularly cultivated infield land).	Low
41	Quarry	N/A	222234	589589	Field survey	Field survey identified a turf-covered quarry situated to the south of a trackway (as shown on the modern Ordnance Survey map). The quarry hollow is approximately 1.2 m deep, with no stone visible.	Negligible
42	Gravel Pits	N/A	222681	589350	Historic maps; Field survey	Two gravel pits are marked at this location on the First Edition Ordnance Survey map (1858, Ayr Sheet LXII.1, 25" to 1 mile). Field survey found that the southern gravel pit (42a) is approximately 2 m deep and is largely turf-covered with some reeds surviving at its base. The northern gravel pit (42b) is sub-rectangular in shape and a maximum of 1.5 m deep. It is turf and reed filled with some exposed bedrock.	Negligible
43	Gravel Pit	N/A	222885	589224	Historic maps; Field survey	A gravel pit is marked at this location to the east of the trackway, on the Second Edition Ordnance Survey map (1910, Ayrshire Sheet LXII.SW, 25" to 1 mile). Field survey found the gravel pit to survive as a turf-covered hollow with reeds growing within its interior. The pit is a maximum of 3 m deep.	Negligible
44	Ordnance Survey	N/A	222944	589131	Field survey	Field survey found a stone which was marked with an Ordnance	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
	<i>benchmark</i>					Survey benchmark.	
45	<i>Gravel Pit</i>	N/A	223275	588953	Historic maps; Field survey	A gravel pit (45a) is marked at this location on the First Edition Ordnance Survey map (1858, Ayr Sheet LXII.1, 25" to 1 mile). Field survey found the gravel pit to survive as a turf-covered hollow with reeds growing within its interior. The pit is a maximum of 3 m deep. A second gravel pit (45b) is located slightly to the north, on the western side of the footpath. It is a maximum of 2m deep.	Negligible
46	<i>Quarry</i>	N/A	223436	588851	Field survey	Field survey identified a turf-covered quarry approximately 2 m deep, situated to the north of the trackway as shown on modern Ordnance Survey mapping.	Negligible
47	<i>Quarry</i>	N/A	223835	588355	Field survey	Field survey identified a small quarry approximately 1 m deep. The quarry survives in a turf-covered condition.	Negligible
48	<i>Building</i>	N/A	223911	587749	Field survey	Field survey identified the remains of a building surviving as low turf-covered banks which are approximately 2 m wide and up to 0.3 m high. The building, orientated north-west to south-east, measures 8 m by 5 m externally and is a sub-rectangular shape with no obvious entrance. It is situated on a natural hummock on the ground.	Low
49	<i>Field bank</i>	N/A	223981	587699	Field survey; Aerial photography	Field survey identified the remains of a turf-covered bank up to 1.5 m wide and up to 0.4 m high. The bank survives in poor condition with many gaps in its course.	Low
50	<i>Gravel Pit</i>	N/A	223919	587647	Historic maps; Field survey	A gravel pit is marked at this location on the Second Edition Ordnance Survey Map (1910, Ayrshire Sheet LXII.SW, 25" to 1 mile). Field survey found a small gravel pit situated to the west of the trackway. The gravel pit survives in a turf-covered condition and is approximately 1.5 m deep.	Negligible
51	<i>Garleffin,</i>	17195	223840	587080	HER; Historic maps; Field	The First Edition Ordnance Survey map (1858, Ayr Sheet LXII.1, 25" to 1 mile) marks three roofed buildings and two enclosures at	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
	<i>farmstead</i>				survey	<p>this location, named as Garleffin.</p> <p>The farmstead comprises:</p> <p>51a – the farmhouse building which survives to full gable height of approximately 3.5 m. The building survives in unroofed condition and is overgrown with ivy and trees. Some harling survives on its southern elevation.</p> <p>51b – an outhouse of stone construction situated to the north-west of the farmhouse. The outhouse survives to a maximum height of 1.5 m. It contains an internal division of brick construction.</p> <p>51c- a second outbuilding which was shown on the First Edition Ordnance Survey map has no upstanding remains, but its location remains visible as a turf-covered terrace cut into the hillslope.</p> <p>51d – A stone built enclosure is situated to the north of the farmhouse (51a). The enclosure is formed by a partially turf-covered wall approximately 1.2 m wide and 1 m high.</p> <p>51e – A second enclosure to the south of the farmhouse (51a) shown on the First Edition Ordnance Survey map no longer survives.</p>	
52	<i>Field bank</i>	N/A	223973	586962	Field survey	Field survey recorded a low field bank of stone construction, approximately 1.5 m wide and surviving to a height of 0.4 m.	Low
53	<i>Field bank</i>	N/A	223880	586840	Aerial photography	A curving length of field bank is visible on modern aerial photography.	Low
54	<i>Enclosure; Field</i>	N/A	223690	586760	Aerial photography	An enclosure, defined by a curvilinear field boundary, is visible on modern aerial photography, but is not marked on the First Edition Ordnance Survey map or on any subsequent editions. It appears to predate the mid-19th century and may be an earlier field associated with the farmstead at Garleffin (51).	Low
55	<i>Field bank</i>	N/A	223750	586810	Historic map; Aerial	An L-shaped field boundary is shown on the First Edition Ordnance Survey map. The field boundary is also detectable on modern	Low

Asset No.	Asset Name & Type	HER no. / Canmore ID.	Easting	Northing	Source(s)	Asset Description	Sensitivity
					photography	aerial photography; it appears to be part of a field system associated with the farmstead at Garleffin (51). The field boundary is not shown on later Ordnance Survey maps.	
56	<i>Barrhill / Craiggannochie; Parish Boundary</i>	62001 / 300611	223730 223719	586001 585868	HER; Canmore	<p>During the construction of the Mark Hill Windfarm substation, the boundary between Colmonell and Barr parishes was recorded. The boundary consisted of an open ditch 1.5 -2 m wide and currently 0.5 m deep. To the north and south of the ditch and unaffected by the development, the boundary consisted of a dry stone wall. The changing nature of the boundary is shown on the 1st Edition Ordnance Survey map of 1857.</p> <p>The Parish Boundary is shown on both the Ordnance Survey First and Second Edition maps but it is thought to date to the 18th century as both parishes are mentioned in the Statistical Account of Scotland dating to 1791-9.</p>	Low

TECHNICAL APPENDIX 6.2: CULTURAL HERITAGE ASSETS WITHIN THE OUTER STUDY AREA WITH PREDICTED VISIBILITY OF THE PROPOSED DEVELOPMENT

Asset No.	Asset Name	Heritage Status	Easting	Northing	Approx Distance from OHL	Maximum No. of Wood Poles Theoretically Visible	Sensitivity of Asset	Impact of Proposed Development on Setting
SM2202	Dinvin, motte	Scheduled Monument	220032	593172	1.3km	37	High	Dinvin is described as one of the best preserved medieval mottes in Scotland. Its setting is within an area of unimproved pasture to the north of a modern road, and within a wider landscape in agricultural use or comprising forestry plantations. Existing 33 kV overhead lines run past the motte. The proposed development would be visible beyond these existing cables, in long distance views at least 1.3 km away.
LB1148	Penkill Castle	Category A Listed Building	223151	598538	1.7km	1	High	Penkill Castle is described as a small castle situated on a peninsular ravine-edge site on the southern bank of the Girvan Water. Mature woodland encloses the castle on all sides and would likely screen views of the proposed development, of which only one pole is predicted by the ZTV to be visible from the Castle.
GDL00047	Bargany	Inventory Garden and Designed Landscape	225042	600778	2.7km	2	High	The Inventory describes Bargany as an 'outstanding designed landscape laid out by W.S. Gilpin'. The bare-earth ZTV predicts visibility of a maximum of 2 wood poles from the southernmost area of the GDL, known as Lovestone plantation. In reality, the mature woodland within this area would likely screen views towards the proposed development which is c. 2.7 km away. The proposed development would not affect any of the key views within the GDL.
LB104	Pinwherry, Daljarrock	Category B Listed	219617	588154	2.9km	13	Medium	Daljarrock Hotel occupies a roadside location adjacent to a modern caravan park, within the valley of the River Stinchar, which forms its localised setting. The proposed

Asset No.	Asset Name	Heritage Status	Easting	Northing	Approx Distance from OHL	Maximum No. of Wood Poles Theoretically Visible	Sensitivity of Asset	Impact of Proposed Development on Setting
	Hotel	Building						development would theoretically be visible almost 3 km away, and would not form a prominent new element in views from the listed buildings.
LB1027	Kirkdominae	Category B Listed Building	225366	592832	2.7km	3	Medium	Kirkdominae comprises the remains of a pre-Reformation chapel situated on a broad terrace above the River Stinchar. The building sits within a woodland plantation which currently forms a localised setting for the building.
LB1055	Pinmore, Railway Viaduct	Category B Listed Building	220116	591053	1.1km	17	Medium	Pinmore Railway Viaduct's 11 arches form an impressive feature of the local landscape passing over the road and the Water of Assel. The viaduct's setting is in relation to the deep valley over which it crosses. The proposed development would theoretically be visible over 1 km to the east, but would have no effect upon the ability to understand the positioning of the viaduct, or upon its impressive appearance.
LB1147	Penkill Farm	Category C Listed Building	223156	598658	1.8km	1	Low	Penkill Farm's setting is in relation to Penkill Castle, and to the other associated buildings of the farm. Its main elevation faces north-west. The ZTV predicts that one pole of the proposed development may be visible approximately 1.8 km to the south. This would not diminish the ability of any visitor to appreciate the setting of the Farm within the surrounding landscape.

TECHNICAL APPENDIX 6.3: LIST OF SOURCES CONSULTED

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7. ECOLOGY & ORNITHOLOGY APPRAISAL

7.1 Introduction

This chapter identifies the potential impacts on ecological and ornithological features associated with the construction and operation of a proposed 33 kilovolt (kV) overhead line (OHL) (hereafter the 'proposed development') connection between Tralorg wind farm and a substation at the Mark Hill wind farm. Where appropriate, it also provides details of mitigation measures to address these potential impacts. The specific objectives of the chapter are to:

- describe the ecological and ornithological baselines;
- identify the potential direct and indirect impacts on ecological and ornithological features; and
- describe any mitigation or control measures proposed to address likely impacts.

This chapter is supported by:

- Appendix 7.1: Ecology and Ornithology Survey Results;
- Appendix 7.2: Protected Species List;
- Appendix 7.3: Site Photographs;
- Appendix 7.4: Great Crested Newt eDNA Survey Results; and
- Appendix 7.5: Confidential Ornithology Survey Results.

Figures 7.1 – 7.4 are provided and referenced in the text, where relevant. Figure 7.4 is confidential.

7.2 Methodology

7.2.1 Study Areas

For the desk study, an ecological study area comprising a 2 km-wide corridor centred on the proposed development was defined, in order to enable data to be gathered to account for potential ecological links outwith the more focused site area. The ornithological desk study area was defined as a 20 km buffer centred on the proposed development in order to assess the connectivity of potential key ornithological species with the proposed development.

The site was defined as a minimum 100 m-wide corridor centred on the proposed development, which was considered to represent the area within which potential impacts on ecology or ornithology would be concentrated due to the working corridor proposed by the Applicant.

7.2.2 Desk Study

A desk study was undertaken to collect existing baseline data about the site and the surrounding area, such as the location of designated sites or other natural features of potential ecological or ornithological importance. The desk study areas considered the following data sources:

- Scottish Natural Heritage (SNH) Sitelink¹; and
- Multi Agency Geographic Information for the Countryside (MAGIC)².

Data sources were searched for protected or notable species records. Examples of notable species include, but are not limited to, national or local Biodiversity Action Plan (BAP) species, restricted range species, species or species groups listed against local designated sites in the area (Local Nature Reserves, Sites of Importance for Nature Conservation, Sites of Nature Conservation Interest) or key species groups such as invertebrates or non-vascular plants. These species are not

¹ <http://gateway.snh.gov.uk/sitelink/>, accessed 18th July 2017

² <http://magic.defra.gov.uk/MagicMap.aspx> accessed 18th July 2017

considered to have the same importance as those protected by legislation; however, their inclusion allows a more holistic approach and therefore a more robust assessment in line with the Applicant's responsibilities under Schedule 9 of the Electricity Act 1989³. This information was used to understand what the key species for the site might be, prior to field surveys. Supplementary information on the site and its surroundings was obtained from aerial images available from Google™ Earth Pro.

The Ayrshire Rivers Trust and District Salmon Fisheries Board were also contacted for baseline information on watercourses and their importance to fish species within the ecological study area.

7.2.3 Field Surveys

Extended Phase 1 Habitat Survey

Surveys were completed in accordance with the methodology of an extended Phase 1 habitat survey⁴ and were undertaken on the 6th, 7th and 8th of July 2016. An additional survey was conducted on the 12th of July 2017 for a deviation in the southern section of the proposed development. The route deviation occurs approximately 500 m east of the previously proposed route from the south of Balligmorrie to the River Muck, with the proposed development now located closer to Knockodhar Wood. The surveys involved a site walkover with an assessment of key habitat, land use and ecological features, focusing on areas of natural interest that could be affected by the proposed development. These habitats were mapped using standard Phase 1 habitat survey methodology as described in the Handbook for Phase 1 Habitat Survey⁵. Target notes were used to record habitats and features of particular interest.

The site was inspected for signs of any invasive plant species subject to legal controls, such as giant hogweed *Heracleum mantegazzianum* or Japanese knotweed *Fallopia japonica*.

The site was assessed for the presence of Groundwater Dependent Terrestrial Ecosystems (GWDTE), which are protected under the Water Framework Directive⁶ due to their hydrological sensitivity and potential to be adversely impacted by development.

The survey included an assessment of the site's ability to support species protected by international and national legislation, particularly badger *Meles meles*, otter *Lutra lutra*, water vole *Arvicola amphibius*, pine marten *Martes martes*, red squirrel *Sciurus vulgaris* and great crested newt *Triturus cristatus*. A full list of all protected species known to occur naturally in Scotland is provided in Appendix 7.2. The location of bird nests, especially those of raptor species, was also recorded.

In addition, any notable species encountered during the course of the surveys were recorded, as defined in Section 1.2.2.

Habitat Suitability Index (HSI)

Ponds within the site were identified and assessed for their suitability to support great crested newt using HSI methodology⁷. This was undertaken on the 12th of July 2017. The HSI is a numerical index, between 0 and 1, with 0 indicating unsuitable habitat and 1 representing optimal habitat for great crested newt. The HSI incorporates ten suitability indices, all of which are factors thought to affect great crested newt.

³ <http://www.legislation.gov.uk/ukpga/1989/29/schedule/9> accessed 19th July 2017

⁴ Joint Nature Conservation Committee (JNCC) (2010) Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit. JNCC Peterborough.

⁵ *Ibid.*

⁶ <https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf> accessed 20th July 2017

⁷ <http://www.narrs.org.uk/documents/HSI%20guidance.pdf> accessed 20th July 2017

Great Crested Newt eDNA Surveys

Any pond within the site with a HSI of 0.5 or greater was sampled for great crested newt eDNA using testing kits from Surescreen Scientifics⁸. Four ponds were sampled on the 23rd of April 2018. Pond samples were then analysed by Surescreen Scientifics for the presence of great crested newt eDNA, the presence of which would indicate a recent historical or current presence of great crested newt in the pond.

Breeding Raptor Surveys

According to SNH guidance on assessing the impact of power lines on birds⁹, the species most susceptible to OHL impacts include waterfowl, waders, raptors and game birds. As a result, breeding bird surveys for passerine birds were not considered necessary. Survey efforts focused on breeding raptor surveys, with vantage point (VP) surveys conducted along the route of the proposed development. The objective of these surveys was to determine if raptor species, such as goshawk *Accipiter gentilis* or peregrine *Falco peregrinus*, were breeding within the site. Surveys were undertaken following best practice guidance¹⁰ and looked for behaviour that would indicate the presence of a nest and, if possible, identify the location of a nest. Three-hour surveys were undertaken at VP locations as shown on Figures 7.1a-b, which recorded all raptor flight activity and whether flights were at collision risk height with the proposed development. The following height bands were assigned to all flights related to the height of the proposed development and the configuration of the OHL, as discussed in Chapter 3: Proposed Development:

- A = 0-5 m;
- B = 5-18 m; and
- C = >18 m.

Surveys were undertaken twice in 2016 on the 3rd May and the 13th June from two VP locations at Barbae and Knockodhar (12 survey hours). Following recommendations from SNH¹¹, four additional sets of surveys from three VP locations at Barbae, Tormitchell and Glenassel were conducted in 2017 on the 30th-31st of March, 11th of April, 10th of May and 14th of June 2017 (30 survey hours). Were any of the earlier survey visits to have identified the presence of goshawk, a July visit would have been completed, as more activity by birds is typically seen at that time following successful breeding. No activity by goshawk was recorded during the March, April or May visits, so a July visit was not considered necessary.

7.2.4 Impact Assessment

A preliminary ecological appraisal¹² of the site was undertaken to assess its ecological value and to consider the likely impacts of the proposed development on the ecological and ornithological features, with the intention of identifying mitigation requirements. No assessment is made of the significance of potential impacts.

⁸ <https://www.surescreenscientifics.com/edna/gcn-edna/> accessed 26th April 2018

⁹ <http://www.snh.gov.uk/docs/A2047189.pdf> accessed 19th July 2017

¹⁰ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2009) *Raptors A Field Guide for Surveys and Monitoring*. The Stationary Office: Edinburgh. ISBN 978 0 11 497345 2.

¹¹ CNS/ELY/OTH – Consultations – Electricity – Ayrshire – CPA143670 – A2155148.

¹² CIEEM (2013) *Technical Guidance Series: Guidelines for Preliminary Ecological Appraisal*. Chartered Institute of Ecology and Environmental Management, Winchester.

7.3 Baseline Conditions

7.3.1 Desk Study

Designated Sites

Figure 7.2a shows the ecological study area and the sites designated for ecological interests and Figure 7.2b shows the ornithological study area and sites designated for ornithological interests. Table 7.1 details the designated sites occurring within both study areas and their connectivity with the proposed development.

Table 7.1: Designated Sites within Ecological and Ornithological Study Areas¹³			
Site Name	Qualifying Features	Distance from Proposed Development (at closest point)	Comments
Glen App and Galloway Moors Special Protection Area (SPA) and SSSI	Breeding population of hen harrier <i>Circus cyaneus</i> (Annex 1 species ¹⁴)	10.5 km to south-west	Over 10 km from proposed development and outwith the maximum connectivity distance ¹⁵ for hen harrier, therefore hen harrier from the SPA are unlikely to be impacted
Ailsa Craig SPA and RSPB Reserve	Supports important migratory species including northern gannet <i>Morus bassanus</i> and lesser black-backed gull. Supports over 20,000 seabirds including guillemot <i>Uria aalge</i> , black-legged kittiwake <i>Rissa tridactyla</i> and herring gull <i>Larus argentatus</i>	18 km to west	No connectivity between qualifying species and proposed development
Lendalfoot Hills Special Area of Conservation (SAC) Complex	Vegetation assemblage, species-rich grasslands and well developed series of alkaline fen habitats	2 km to east	Separate catchment from proposed development, which would not impact the integrity of any qualifying features
Aldons Hill SSSI	Mosaic of grassland, wet and dry heathland and upland habitats	2 km to east	Separate catchment from proposed development, which would not impact the integrity of any qualifying features

¹³ <https://www.south-ayrshire.gov.uk/documents/seaenv%20r%20appendix%201%20env%20baseline.pdf> accessed 28th June 2017

¹⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF> accessed 28th June 2017

¹⁵ <http://www.snh.gov.uk/docs/A994842.pdf> accessed 28th July 2017

Galloway Forest Park Important Bird Area (IBA)	Short-eared owl <i>Asio flammeus</i> , peregrine and black grouse <i>Lyrurus tetrix</i>	5.5 km to east	Proposed development outwith maximum connectivity distance of short-eared owl and black grouse. Some connectivity with foraging peregrine and birds moving between alternative nest sites
Wood of Cree RSPB Reserve	Small passerine species including pied flycatcher <i>Ficedula hypoleuca</i> and redstart <i>Phoenicurus phoenicurus</i>	16 km to south-east	No connectivity between qualifying species and proposed development
Galloway and South Ayrshire Biosphere Reserve	Based on the Galloway Hills, a water catchment feeding south-west Scotland. Includes rivers Cree, Fleet, Ken-Dee, Nith, Doon, Water of Girvan and Stinchar. Core areas comprise Cairnsmore of Fleet National Nature Reserve (NNR), the Silver Flowe Site of Special Scientific Interest (SSSI) and the Merrick Kells SSSI	Covers the entirety of the proposed development	Proposed development crosses River Stinchar south of Pinmore. Potential for disturbance/pollution of watercourse. However, the District Salmon Fisheries Board and Ayrshire Rivers Trust have been contacted and both agree that, as the proposed development would not enter the River Stinchar and would be far enough from the bank, direct impacts on the habitat and fish species are likely to be avoided. Indirect impacts are still considered possible.

There are several areas of woodland identified as ancient woodland or included on the semi-natural woodland inventory¹⁶ occurring within the ecological study area, as shown on Figure 7.2a. The proposed development directly crosses small areas to the north-east and east of Tormitchell, north and south of Pinmore and north of Bellamore. The largest areas of woodland included on the semi-natural woodland inventory occur to the north and south-west of Bellamore. Native and ancient woodlands are important for biodiversity and nature conservation, providing habitat for species such as badger, red squirrel, pine marten and bat species. Ancient woodland is defined as woodlands that have been continually wooded since 1750, and there is a strong presumption in Scottish Planning Policy against the removal of woodland on ancient woodland sites¹⁷.

Protected Species

The desk study produced the following records of protected or notable species occurring within the study area, primarily at Girvan harbour:

- red-throated diver *Gavia stellata*;
- redshank *Tringa tetanus*;

¹⁶ <https://gateway.snh.gov.uk/natural-spaces/dataset.jsp?dsid=AWI> accessed 31st July 2017

¹⁷ <http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/woodlands/> accessed 28th June 2017

- dunlin *Calidris alpina*;
- eider *Somateria mollissima*;
- oystercatcher *Haematopus ostralegus*;
- turnstone *Arenaria interpres*;
- goldeneye *Bucephala clangula*;
- ringed plover *Charadrius hiaticula*;
- shag *Phalacrocorax aristotelis*;
- scaup *Aythya marila*; and
- sanderling *Calidris alba*.

Ringed plover, shag and scaup are all red listed species on the Birds of Conservation Concern¹⁸. The other species are amber listed. Amber and red listed species indicate an increasing level of conservation concern.

The Muck Water is important for spawning of Atlantic salmon *Salmo salar*.

Invasive Species

Invasive plant species are known to be present in the area, particularly Himalayan balsam *Impatiens glandulifera* and Japanese knotweed along the River Stinchar and Muck Water. Giant hogweed is present in Tormitchell quarry.

7.3.2 Field Surveys

This section provides a summary of habitats identified during the ecological walkover survey and any protected species recorded. A full description of habitat types, dominant plant species recorded and target notes can be found in Appendix 7.1: Ecology and Ornithology Survey Results.

Habitats

Figures 7.3a-i show the locations of the following habitat areas recorded and their proximity to the proposed development:

- semi-natural and plantation woodland (broadleaved, coniferous and mixed);
- scrub (dense and continuous);
- grassland (improved, semi-improved neutral and marshy);
- bog (blanket sphagnum and wet modified);
- continuous bracken *Pteridium aquilinum*;
- running water; and
- hedgerows (species-rich and species-poor, defunct and intact).

The site is dominated by heavily grazed pasture consisting of improved and semi-improved neutral grassland of low species diversity. A large area of blanket bog occurs in the southern part of the site, north-west of Bellamore (Figures 7.3g-h). Blanket bog is listed on Annex 1 of the EC Habitats Directive¹⁹ as an international priority habitat. It is also a priority habitat on the UK BAP. Two smaller areas of wet modified bog occur to the south of Balligmore (Figure 7.3f) and north of Mark Hill substation (Figure 7.3i). Areas of marshy grassland also occur throughout the proposed development.

¹⁸ https://www.bto.org/sites/default/files/shared_documents/publications/birds-conservation-concern/birds-of-conservation-concern-4-leaflet.pdf accessed 26th April 2018

¹⁹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:020:0007:0025:EN:PDF> accessed 28th June 2017

Nine areas of GWDTE²⁰ were identified within the proposed development and are assessed in Appendix 8.2: GWDTE Appraisal.

The proposed development passes through small areas of woodland on Tralodden Hill, north of Glenassel, south of Barbae, south-east of Laggan Bridge, east of Maclachrieston and north of the River Stinchar (Figures 7.3a-e).

Four ponds were identified during the Phase 1 habitat survey of the route deviation, as shown by Target Notes 16, 22, 25 and 26 on Figures 7.3h-i.

No invasive plant species were recorded during the surveys.

Protected Species

The HSI of the ponds at Target Notes 16, 22, 25 and 26 recorded during the Phase 1 habitat survey were calculated as 0.66, 0.62, 0.66 and 0.56, respectively. All four ponds have average suitability to support great crested newt. The ponds were sampled for great crested newt eDNA and all were negative, indicating that great crested newts are not present in the ponds. The analysis certificates confirming no great crested newt eDNA was detected are provided in Appendix 7.4.

A single otter spraint was recorded along the River Stinchar to the south of Mahaffie Wood, as shown by Target Note 10 on Figure 7.3e. No holts were recorded during the survey, although the watercourses crossed by the proposed development were noted to be suitable to support otter.

Trees with bat roost potential were identified throughout the site, as shown by Target Notes 4, 5, 7-8, 11, 18 and 20 on Figures 7.3d-e.

Potential water vole habitat was recorded throughout the site, as shown by Target Notes 9, 12, 13, 15, 17, 21, 23 and 24 on Figures 7.3e-i. There was evidence of potential water vole runs within the vegetation but no burrows or droppings were recorded.

Habitats were noted to be suitable to support badger although no field signs were recorded during surveys. The peatland habitat in the southern extent of the site was also noted to be suitable to support reptiles such as common lizard *Zootoca vivipara* and adder *Vipera berus*, although no sightings of these species were recorded.

A small sand martin *Riparia riparia* colony of approximately 10 burrows was recorded on the western bank of the Water of Assel, as shown by Target Note 3 on Figure 7.3c.

Breeding Raptors

Flight activity data gathered during the 2016 and 2017 surveys identified a kestrel *Falco tinnunculus* territory and a buzzard *Buteo buteo* territory, as shown on confidential Figure 7.4. Although a survey was not undertaken to search for the nests, potential nest locations are considered to occur at Target Notes 2 and 4, as shown on Figure 7.4 and detailed in Table 7.5.2 in Appendix 7.5: Confidential Ornithology Survey Results. These locations have been considered based on the flight activity data collected for both species. A specific nest survey was not undertaken to avoid disturbance during the breeding season and since both locations are unlikely to be impacted by the proposed development, as discussed in Appendix 7.5: Confidential Ornithology Survey Results.

A single peregrine flight was recorded above collision risk height at Glenassel and a single osprey *Pandion haliaetus* flight above collision risk height at Barbae. Both flights were considered to be commuting/migratory flights. Two sparrowhawk *Accipiter nisus* flights were also recorded at

²⁰ <https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf> accessed 28th July 2017

Barbae, one at collision risk height across the proposed development. Three buzzard flights also occurred at collision risk height across the proposed development.

7.4 Potential Impacts and Mitigation

7.4.1 Construction

Potential impacts during construction are detailed in Table 7.2 below, which also details the relevant ecological or ornithological feature and mitigation or control measures, where appropriate.

Table 7.2: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures

Potential Impact	Feature	Mitigation/Control Measures Proposed
Vegetation clearance, tree felling, access track construction, permanent excavation of pole bases, excavation and undergrounding of cable section and placement of temporary construction compound.	Habitats (woodland, marshy grassland and hedgerows. Blanket bog and wet modified bog are considered below. GWDTE are considered in Appendix 8.2: GWDTE Appraisal)	<ul style="list-style-type: none"> • Immediate reinstatement of habitats following construction activities in areas of temporary access, particularly access tracks, the construction compound and the cable section, where existing vegetation would be replaced on the excavated trench, where possible. Temporary access tracks proposed between Muck Water and Mark Hill substation would be 3 m wide and of a floating stone construction, running adjacent to the underground cable route to minimise the impacts on habitats. The track would be removed following energisation of the connection, or before, and the ground reinstated. Other areas of the proposed development would be accessed using low ground-pressure vehicles without the construction of access tracks; • Avoidance of areas of marshy grassland, where possible. If not possible, floating access tracks/bog mats and low ground-pressure vehicles would be used to cross these habitats. Locating woodpoles within these habitats would be avoided as far as possible, with only three woodpoles locations proposed in marshy grassland; • Avoidance of removal of hedgerow habitat, as shown on Figures 7.3a and 7.3f; • Avoidance of tree felling, where possible, particularly in areas classified as ancient woodland or included on the semi-natural woodland inventory. This is in line with the Scottish Government’s Policy on Control of Woodland Removal²¹, as referenced by the Scottish Planning Policy²², which includes a presumption against any woodland removal. Minimal tree felling is considered to be required for the proposed development and is discussed in more detail in Chapter 9: Forestry. The proposed development does not cross any areas of ancient woodland but three woodpole locations are proposed in areas included on the semi-natural woodland inventory.
Disturbance/loss of Annex 1 habitats from access track construction, permanent excavation of pole bases and	Blanket bog and wet modified bog	<ul style="list-style-type: none"> • Avoidance of blanket bog and wet modified bog, where possible. If not possible, floating access tracks/bog mats and low ground-pressure vehicles would be used to cross these habitats. Peat probing results would be used to inform the micro-siting of woodpole locations to avoid areas of deep peat. However, if this is not possible, suitable restoration would be undertaken and a Peatland Habitat Management Plan would be produced; and • Engagement with SEPA would occur in regard to any excavated peat reuse and disposal, where required. However, it is not anticipated that there would be a need for peat disposal as all excavated material would be backfilled.

²¹ Forestry Commission (2009) The Scottish Government’s Policy on Control of Woodland Removal, Forestry Commission Scotland National Office, Silvan House, 231 Corstorphine Road, Edinburgh, EH12 7AT

²² The Scottish Government (2014) Scottish Planning Policy, The Scottish Government, St Andrew’s House, Edinburgh, EH1 3DG.

Table 7.2: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures		
excavation and undergrounding of cable section		
Felling of mature trees or trees with bat roost potential	Bats and red squirrel	<ul style="list-style-type: none"> If tree felling is necessary, mature trees or areas noted as containing trees with bat roost potential would be surveyed by a licensed bat surveyor to ensure no bats are roosting in the trees. At the same time, trees to be felled would be checked for the presence of squirrel dreys; and If bats are found to be roosting in the trees, felling would only occur under an SNH licence with a licensed bat surveyor present. Similarly, if a red squirrel drey is found to be present, felling could only occur under an SNH licence.
Disturbance from lights, noise and excavations	Otter, badger, water vole and reptiles	<ul style="list-style-type: none"> Undertake pre-construction surveys for otter, badger and water vole no greater than eight months prior to construction. If the results indicate the presence of any of these species, an assessment of the impacts of the development on the species would be completed and appropriate mitigation measures identified (if required), such as micrositing of woodpoles and access tracks; and Construction phase Environmental Management Plan (EMP) to include measures to protect ecological features, which would involve covering excavations and providing ramps in excavations to allow any trapped species to escape. These measures would be implemented at the end of each work day. A suitably qualified Ecological Clerk of Works (ECoW) would input into the EMP to ensure appropriate mitigation measures are in place, and to reduce any disturbance impacts.
Destruction of bird nests	Breeding birds	<ul style="list-style-type: none"> Avoidance of sand martin colony located on the western bank of the Water of Assel; and Ground or vegetation clearance works would be undertaken outwith the main bird nesting season (March–August inclusive), if possible. If this is not possible, a suitably experienced ecologist would check the proposed development prior to construction to determine if nesting birds are present, particularly the sand martin colony on the western bank of the Water of Assel. If nesting birds are found, a suitable buffer zone would be implemented around the nest, with no work in this zone until the young have fledged or the nest is no longer in use.
Pollution, e.g. oil spill or siltation,	Galloway and South Ayrshire Biosphere	<ul style="list-style-type: none"> Good practice guidance²³²⁴ would be followed when working close to watercourses and ponds;

²³ https://www.sepa.org.uk/media/150997/wat_sg_29.pdf accessed 28th July 2017

²⁴ <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/> accessed 28th July 2017

Table 7.2: Potential Impacts on Ecology and Ornithology during Construction and Relevant Mitigation/Control Measures		
and disturbance of watercourses	Reserve (River Stinchar), Muck Water, four ponds and other watercourses as described in Chapter 8: Hydrology	<ul style="list-style-type: none"> The OHL construction would not require the construction of any new watercourse crossings, other than for the River Stinchar but this would not require any in-channel works. Access would use existing tracks and watercourse crossings as far as possible. Bog mats would be used to cross minor watercourses without damage to bank integrity; Where pole installation is required within 30 m of a watercourse, silt traps or other mitigation would be put in place (which would be outlined in the EMP), with nearby watercourses checked during periods of high rainfall during construction activities. Ground excavation work would temporarily stop work during periods of high rainfall, where a risk to surface water quality is identified; In order to cross the Muck Water, an open-cut with a flume crossing would be used. Consultation with the Ayrshire Rivers Trust has been undertaken and it has been agreed that the underground cable would be installed May to September, inclusive, to avoid the salmon spawning season. A fish rescue would be organised with the Ayrshire Rivers Trust and undertaken prior to construction; and Measures to prevent pollution and/or siltation of watercourses, ponds and other habitats during construction would be included in the EMP.
Spread of invasive plant species	Habitats	<ul style="list-style-type: none"> Although no invasive species were recorded during surveys, they are known to be present in the area. Any areas of invasive plant species discovered prior to (such as during pre-construction protected species surveys) or during construction would be separated from any construction by a minimum buffer of 10 m to avoid the spread of the invasive species. No invasive plant species or soil material potentially contaminated with seeds/roots would be disturbed or removed from the area.

7.4.2 Operation

Potential impacts during operation are detailed in Table 7.3 below, which also details the relevant ecological or ornithological feature and mitigation or control measures, where appropriate.

Table 7.3: Potential Impacts on Ecology and Ornithology during Operation and Relevant Mitigation/Control Measures		
Potential Impact	Feature	Mitigation/Control Measures Proposed
Disturbance due to maintenance activities	Bats, red squirrel, otter, badger, water vole, reptiles and breeding birds	<ul style="list-style-type: none"> Unlikely to be required as disturbance would be at a very low level and would utilise existing access tracks/roads; and

Table 7.3: Potential Impacts on Ecology and Ornithology during Operation and Relevant Mitigation/Control Measures		
Potential Impact	Feature	Mitigation/Control Measures Proposed
		<ul style="list-style-type: none"> If any vegetation clearance is required, breeding bird and protected species surveys would occur prior to this, where appropriate.
Pollution e.g. oil spill from vehicles accessing proposed development for maintenance activities	Habitats	<ul style="list-style-type: none"> Oil spill kits carried in vehicles, particularly when working in sensitive habitats such as blanket bog, marshy grassland and close to watercourses or ponds.
Collision with OHL	Raptor species	<ul style="list-style-type: none"> Buzzard, peregrine, osprey and sparrowhawk are not considered to be highly vulnerable to collision risk²⁵. SNH guidance for power lines advises against the use of mathematical collision risk models and instead suggests the use of mitigation to reduce potential collision impacts where flight activity levels are high enough to cause potential conflicts²⁶. The flight activity levels observed within the site are low and it is considered that the potential for impacts is similarly low. In addition, the proposed development would consist of a wood pole line with the configuration of wires arranged in one horizontal plane, therefore presenting only a very narrow band within which a collision would be possible. The three wires are arranged in a narrow configuration so that the collision zone for birds not approaching the line in horizontal flight is similarly narrow. The likelihood of a collision is therefore deemed to be very low and is not considered to require mitigation or control measures.

²⁵ Urquhart, B. (2010) SNH Avoidance Rate Information & Guidance Note: Use of Avoidance Rates in the SNH Wind Farm Collision Risk Model. SNH.

²⁶ SNH (2016) Assessment and Mitigation of Impacts of Power Lines and Guyed Meteorological Masts on Birds, Version 1.

7.5 Cumulative Impact Assessment

This section assesses the additional impacts from the proposed development when added to the impacts from other committed developments that have the potential to have similar impacts and result in a cumulative effect. Similar developments in the vicinity of the proposed development are:

- the proposed Stranoch wind farm grid connection which is a 132 kV OHL, running approximately 20 km northwards from the proposed Stranoch wind farm site to the Mark Hill substation. The Stranoch wind farm grid connection will be the subject of a separate application for consent under s.37 of the Electricity Act 1989; and
- the proposed 8-turbine Tralorg wind farm, which lies immediately north of the proposed development.

Since SPEN will be the Applicant for the Stranoch wind farm grid connection, and is currently gathering environmental data on this project, the cumulative effects of the proposed development would be considered in the Stranoch wind farm grid connection EIA. At this preliminary stage, taking a precautionary approach, potential impacts of the Stranoch wind farm grid connection could include habitat loss, (blanket bog, modified bog and marshy grassland), and destruction of breeding bird nests if work occurs during the breeding bird season. However, no impact assessment has yet been undertaken for the Stranoch wind farm grid connection, therefore a detailed consideration of cumulative effects and their significance cannot be made in this assessment.

7.5.1 Tralorg Wind Farm

Potential impacts on the following ecological and ornithological features are considered in the Tralorg wind farm EIA:

- habitat loss and degradation of blanket bog and semi-natural broadleaved woodland;
- loss of habitat suitable for otter and water vole; and
- destruction of nests used by breeding birds.

Proposed mitigation measures included the following:

- sensitive construction design and micrositing;
- habitat management plan and monitoring programme to establish whether the degraded bog could be restored;
- construction method statement to include a programme for peat handling and the re-vegetation of worked areas;
- replanting with trees of local provenance to provide a direct replacement for the woodland lost;
- pre-construction protected species surveys and nesting bird survey if construction to occur within the breeding bird season; and
- general biodiversity enhancements within the wind farm area, focussing on the management of habitats for ground nesting passerines, particularly meadow pipit *Anthus pratensis* and skylark *Alauda arvensis*.

Following implementation of mitigation measures, the residual effects were determined to be not significant.

Although the Tralorg wind farm EIA did not identify any significant effects, cumulative effects on ecological or ornithological features are possible when considered in combination with the

proposed development detailed in this Chapter. Cumulative effects may occur from the habitat loss of blanket bog and semi-natural broadleaved woodland.