Lorg Wind Farm Grid Connection

Environmental Impact Assessment Report

Chapter 3: Proposed Development

November 25

Land & Planning

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3 PROPOSED DEVELOPMENT

3.1 Proposed Development Overview

3.1.1 The Proposed Development comprises the construction and operation of a new 17.5 km 132 kV wood pole (Trident) overhead line (OHL) between the proposed Lorg Wind Farm and the proposed Holm Hill substation (both of which are being consented separately and are not assessed as part of this Environmental Impact Assessment Report (EIAR)). The proposed OHL comprises 201 poles, reaching a maximum height of 15.1 m.

3.1.2 The proposed Holm Hill substation is located north of Carsphairn, north-east of the A713. From here, the proposed OHL is routed in an easterly direction bypassing the north of Quantans Hill for approximately 9 km. The route enters the Water of Ken valley at the confluence with Craigengillan Burn and then follows the valley in a north-easterly direction for approximately 8.5 km, past the settlements of Strahanna, Euchrae, Corlae and Craigythorn until it reaches the connection point with the proposed Lorg Wind Farm. A route overview plan is provided in **Figure 1.1: Site Location**.

3.1.3 In addition to the permanent OHL infrastructure, deemed planning under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997[1] is sought for temporary (construction phase) ancillary components of the Proposed Development comprising:

- laydown areas;
- working areas;
- access tracks; and
- scaffolding to protect road, track and watercourse crossings during construction.

3.1.4 The permanent and temporary components of the Proposed Development are shown in **Figure 3.1: Proposed Development** and described in more detail in the sections below.

3.2 Permanent Infrastructure

Trident Wood Pole OHL

3.2.1 The proposed OHL would be constructed using Trident wood poles of an 'H' pole design (two uprights), as shown in **Photo 3.1**, as they can withstand greater ice and wind loadings and are more suited to the altitudes at this Site.

3.2.2 There are three types of pole configuration:

- **Intermediate:** where the pole is part of a straight-line section;
- **Angle:** where the OHL changes direction. 'H' poles can support changes in direction up to a maximum of 70 degrees. All angle structures require to be back stayed; and
- **Terminal:** where the OHL terminates into a substation or on to an underground cable section via a cable sealing end.

3.2.3 The wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structural integrity. This results in a dark brown appearance, which would weather to a grey colour over a period of approximately five years following installation.

[1] Scottish Government (1997). Town and Country Planning (Scotland) Act 1997. Available online at: https://www.legislation.gov.uk/ukpga/1997/8/contents.

3.2.4 Typical heights for the Trident wood poles, including insulators, are 13 m above-ground height on average, however dependent on the topography and other engineering constraints the height can range between 10 m and a maximum height of 15.1 m. Typical spans between 'H' configuration Trident wood poles for this project and terrain would range from 60 m to 155 m, with an average of approximately 103 m. This would vary depending on factors such as the size of the conductor, the size of the structures, terrain, ice and wind loadings.

3.2.5 Each pole structure would be topped by a galvanised steelwork cross-arm. The steelwork cross-arm would have polymeric insulators of a grey rubber or plastic type that would carry a single three phase circuit, which means that the poles would support two different specifications of three conductors.

3.2.6 Poles 1 to 95 would be strung with 'Eagle' 358 mm^2 ACCR high temperature low sag (HTLS) phase conductors and with a below underslung separate ALL Dielectric self-supporting (ADSS) fibre-optic cable. Poles 95 to 186 would be strung with 'UPAS' 300 mm^2 AAAC outer phases with inner phase being Optical phase wire (OPPC) UPAS equivalent (fibre-optic telecommunication wire for control purposes).

3.2.7 Where the proposed OHL enters Holm Hill substation, the OHL line entry would terminate onto a gantry structure. At Lorg Wind Farm substation, the proposed OHL would also connect directly into the substation, terminating onto a gantry structure.

Photo 3.1 Typical Intermediate H Pole

Infrastructure Location Allowance (ILA)

3.2.8 The proposed ILA alignment and pole positions, as presented in **Figure 3.1: Proposed Development**, have been determined based on technical design work, engineering analysis of ground conditions and suitability, and the environmental assessments reported within this EIAR.

3.2.9 However, it is anticipated that during the construction process there may be a requirement to microsite elements of the Proposed Development infrastructure, such as the pole positions, to account for factors including:

- pre-construction confirmation of dynamic environmental conditions, e.g. the location of protected species;

- more detailed technical survey information, particularly for unconfirmed ground conditions;
- to provide further scope for the effective mitigation of any likely significant environmental effects; and
- in response to minor alterations requested by landowners.

3.2.10 To ensure that the final positioning of the Proposed Development is not varied to such a degree as to cause an increase in the significance of likely significant environmental effects outlined in this EIAR, an ILA has been taken into consideration as part of the technical assessments. This would permit the siting of the Proposed Development components to be adjusted within a 25 m radius of the proposed OHL alignment and pole positions. The ILA is presented in **Figure 3.1: Proposed Development**.

3.2.11 Implementation of the ILA would be controlled through the processes detailed in the Outline Construction Environmental Management Plan (CEMP) (submitted as part of the Section 37 Application), whereby any micro siting within the ILA would be subject to approval of the Environmental Clerk of Works (ECoW) in consideration of other known constraints.

3.3 Temporary Infrastructure

Construction Compound

3.3.1 It is currently anticipated that a single main temporary construction compound would be required, the location of which would be confirmed by the Principal Contractor. The construction compound would provide site cabins, stores, welfare facilities, vehicle parking and a bunded area for pole storage.

3.3.2 The Principal Contractor would be responsible for securing the appropriate planning consent for this compound, and for ensuring its siting does not materially alter the findings of this EIAR.

Laydown Areas

3.3.3 As shown on **Figure 3.1: Proposed Development,** 27 temporary laydown areas would be required along the Proposed Development. The laydown areas would be covered by crushed stone to provide a durable surface to support the vehicles, plant and materials.

Working Areas

3.3.4 Temporary working areas around each pole location would be required for foundation excavation and pole erection, with the average dimensions of typical working areas being 30 m x 20 m. Working areas would also be required at the end of each stringing section, for use as pulling areas for winching the OHL into position. It is estimate that 228 temporary working areas would be required for the Proposed Development, however exact locations and details would be specified by the Principal Contractor.

3.3.5 Indicative working areas are shown on **Figure 3.1: Proposed Development.**

Existing Access Tracks

3.3.6 It is proposed to use a combination of existing access tracks and new temporary access tracks, as indicated on **Figure 3.1: Proposed Development**.

3.3.7 Existing tracks would be tested to ensure stability for plant and vehicular access followed by a temporary dressing of Type 1 stone or similar. Depending on the results of the testing, the stone dressing may be up to 250 mm in depth for the full width of the existing track.

Temporary Access Tracks

3.3.8 Where new tracks are required, the depth and width would vary depending on the type of vehicles intended to utilise the tracks, but they would typically be 3.5 m wide and 150 mm in depth and would be constructed using stone (as shown in **Photo 3.4**) and geomembrane (as shown in **Photo 3.3**). Some roads would be wider in places (up to 6 m) to accommodate passing places located at a suitable frequency to provide a line of sight between passing places. These passing places would be constructed by trackway panels (as shown in **Photo 3.2**).

3.3.9 Some micro-siting of new temporary access tracks may be required, within the 25 m ILA, for example to avoid areas of deep peat. Depending on the ground conditions, facilitated access may be necessary and would be established through a combination of:

- trackway panels and/or bog mats to cross soft ground and to minimise the impact on soils, especially in peaty areas; and
- installation of temporary new stone tracks.

Photo 3.2 Trackway Temporary Access Track

Photo 3.3 Temporary Access Track Installation Using Geomembrane

Photo 3.4 Typical Stone Temporary Access Track

3.3.10 Where proposed access tracks are required to cross watercourses, temporary watercourse crossings points would be established. Depending on the nature and size of the watercourse, this may utilise trackway, a temporary bridge (as shown in **Photo 3.5**) or culvert (as shown in **Photo 3.6**).

Photo 3.5 Temporary Bridge Crossing

Photo 3.6 Typical Culvert Crossing

Scaffolding

3.3.11 Where the OHL needs to be strung over existing roads, tracks or watercourses, protection in the form of scaffolding would be erected prior to the commencement of stringing. It is predicted that 10 temporary scaffolding locations are required, as indicated on **Figure 3.1: Proposed Development.**

3.3.12 Scaffolding would be erected at either side of the crossing, with the span in between the scaffolding netted, as shown on **Photo 3.7** below.

Photo 3.7 Scaffolding Crossing

3.4 Construction Methodology

Phase 1 – Enabling Works

Temporary Works

3.4.1 Temporary works are generally described as the parts of a construction project that are needed to enable the permanent works to be undertaken. These works would comprise:

- fencing or hoarding installation as required;
- establishment of accesses, including any temporary crossings required;
- establishment of the construction compound and laydown areas; and
- scaffolding erection where the OHL crosses roads, tracks or watercourses.

Service Diversions

3.4.2 Works shall be required to part of the existing 11 kV distribution network infrastructure crossed by the Proposed Development. The existing 11 kV OHL is required to be undergrounded between Strahanna and Corlea due to technical constraints resulting from two OHLs in close proximity. The undergrounding works would be undertaken by SP Distribution plc (SPD) under a separate contract, and any likely significant environmental effects would be assessed by SPD. These works do not form part of the current application, and they are not required to be assessed in this EIAR.

Forestry Felling

3.4.3 The felling of some forestry woodland and individual trees would be required to physically construct the Proposed Development and to maintain the statutory clearances required for its safe operation and maintenance.

3.4.4 Felling of woodland to accommodate the Proposed Development would be required along the Ken Valley and in proximity to the Craigengillan Burn. Felling would take place to wind-firm edges where necessary to ensure the edge of woodland is able to withstand strong winds and resist windthrow (blowdown), wind-rocking, and major breakage. It is anticipated that 52.19 ha of forestry would be lost as a result of the Proposed Development.

3.4.5 Further information relating to forestry effects, including details of areas where felling is considered necessary, is provided in **Chapter 6: Forestry.**

Phase 2 – Construction Works

Pole Delivery

3.4.6 Access, delivery and assembly of the poles would be undertaken using a tracked excavator and low ground-pressure vehicles (e.g. tractor, Marooka type all-terrain vehicles (ATVs)). In certain situations, helicopters may be used for pole delivery to the point of installation. Helicopter delivery would involve flying the poles from a laydown area to the pole position, ready for installation by excavators. This reduces the number of trips back and forth by other means of machinery, reducing land damage.

3.4.7 Where helicopter delivery is utilised, mitigation to limit disturbance to local residents would be put in place, as detailed in the Outline CEMP submitted as part of the Section 37 application.

Pole Construction

3.4.8 At the pole installation location, turf and topsoil would be removed together to retain the turf root system and be stored within the working area for reinstatement. Excavations would then be dug, typically 3 m wide and 2 m below ground level (bgl) (up to a maximum 3 m deep). Excavated subsoil would be stored separately from the turf and topsoil. The works would be carried out in accordance with **Appendix 10.2: Soil and Peat Management Plan (SPMP)**. Once the foundations have been prepared, excavator(s) would hoist the assembled pole structure into position (as shown in **Photo 3.8**). Foundation bog-shoe arrangements would be required where poles are to be installed in poor ground conditions (as shown in **Photo 3.9**).

Photo 3.8 Pole Installation by a Track Excavator

Photo 3.9 Foundation Bog-shoe Arrangement for Poor Ground Conditions

3.4.9 Once erected, the pole would be braced, then the excavation would be backfilled with the stored material in the reverse order to which it was dug out, to maintain the original soil horizons. Backfilling would be progressed in layers of approximately 300-400 mm deep, with stone hard core added as required around foundation blocks to ensure adequate compaction and suitable geotechnical conditions are maintained between each layer. No concrete is anticipated to be required.

3.4.10 When replacing the topsoil and turf around the pole, it would be left slightly proud off ground level (approximately 150/ 300 mm) to allow for the excavation to naturally compact further over time.

Conductor Stringing

3.4.11 On completion of the pole structure erection in a given section of the route, the installation of the OHL conductors can commence.

3.4.12 Conductor stringing equipment (i.e. winches, tensioners and ancillary equipment) are set out at either end of pre-selected sections of the OHL, typically at angle poles or terminal poles. These poles therefore require access for heavy vehicles to transport the conductor drums and large winches. Ground protection measures would be used such as trackway panels to protect the ground at these locations.

3.4.13 Pilot wires would be pulled through the section to be strung. These would be hung on blocks (wheels) at each suspension tower and connected to a winch and tensioner at the respective end of the section. The winch, in conjunction with the tensioner is used to pull the pilot wires between the structures. The conductor is pulled via the pilot wires through the section under tension to avoid contact with the ground and any underrunning obstacles. Once the conductor has been strung between the ends of the section it is then tensioned and permanently clamped at each tower.

Phase 3 - Commissioning

3.4.14 The Proposed Development would then be subject to an inspection and snagging process. This allows the Principal Contractor and The Applicant to check that the works have been built to specification and are fit to energise. The Proposed Development would also go through a commissioning procedure for the switchgear, communications and protection controls through the substations. The circuits would then be energised from the substations.

Phase 4 - Reinstatement

3.4.15 Following commissioning of the Proposed Development, all construction sites would be reinstated. Reinstatement would form part of the contract obligations for the Principal Contractor and would include the removal of all temporary access tracks, all work sites around the pole locations and the re-vegetation of all construction compounds etc. Where soil has been excavated it would be backfilled to maintain the original soil horizons and left to revegetate naturally wherever possible.

3.5 Construction Programme and Working Hours

3.5.1 An indicative programme for the Proposed Development is provided in **Table 3.1** below.

Table 3.1 Indicative Programme

	2026				2027											2028			
	September	October	Novermber	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April
Site Mobilisation and Access Works (felling, access installation, construction compound, laydown areas)																				
Main Construction (wood pole erection, conductor pulling)																				
Commissioning of New 132 kV OHL and reinstatement of temporary access tracks, laydown areas and working areas																				

3.5.2 Construction working hours would typically be between 08:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturdays. Should works be required to take place out with these hours, it would be agreed in advance with Dumfries and Galloway Council.

3.6 Construction Traffic

3.6.1 A Construction Traffic Management Plan (CTMP) would be prepared by the Principal Contractor prior to any works commencing, in consultation with Dumfries and Galloway Council, Ayrshire Roads Alliance and Transport Scotland, as required. The CTMP would describe the anticipated traffic movements associated with construction of the Proposed Development, and all mitigation and signage measures that are proposed on the public road network. A Framework Construction Traffic Management Plan (FCTMP) therefore accompanies this Application in **Appendix 3.1: Framework Construction Traffic Management Plan**, upon which the CTMP would be based.

3.6.2 An estimate of the type and volume of Site traffic anticipated for a project of this scale is included in the **Appendix 3.1: Framework Construction Traffic Management Plan**.

3.6.3 Construction of the Proposed Development would give rise to regular numbers of staff transport movements, with small work crews travelling to work site areas. Based on other similar developments, it is expected that construction works would be undertaken by up to 5 teams of approximately 15 staff.

3.6.4 Vehicles would primarily access the Site via 13 proposed junctions along the A713, B729 and the unclassified C35S, as shown in **Plate 3.10** below.

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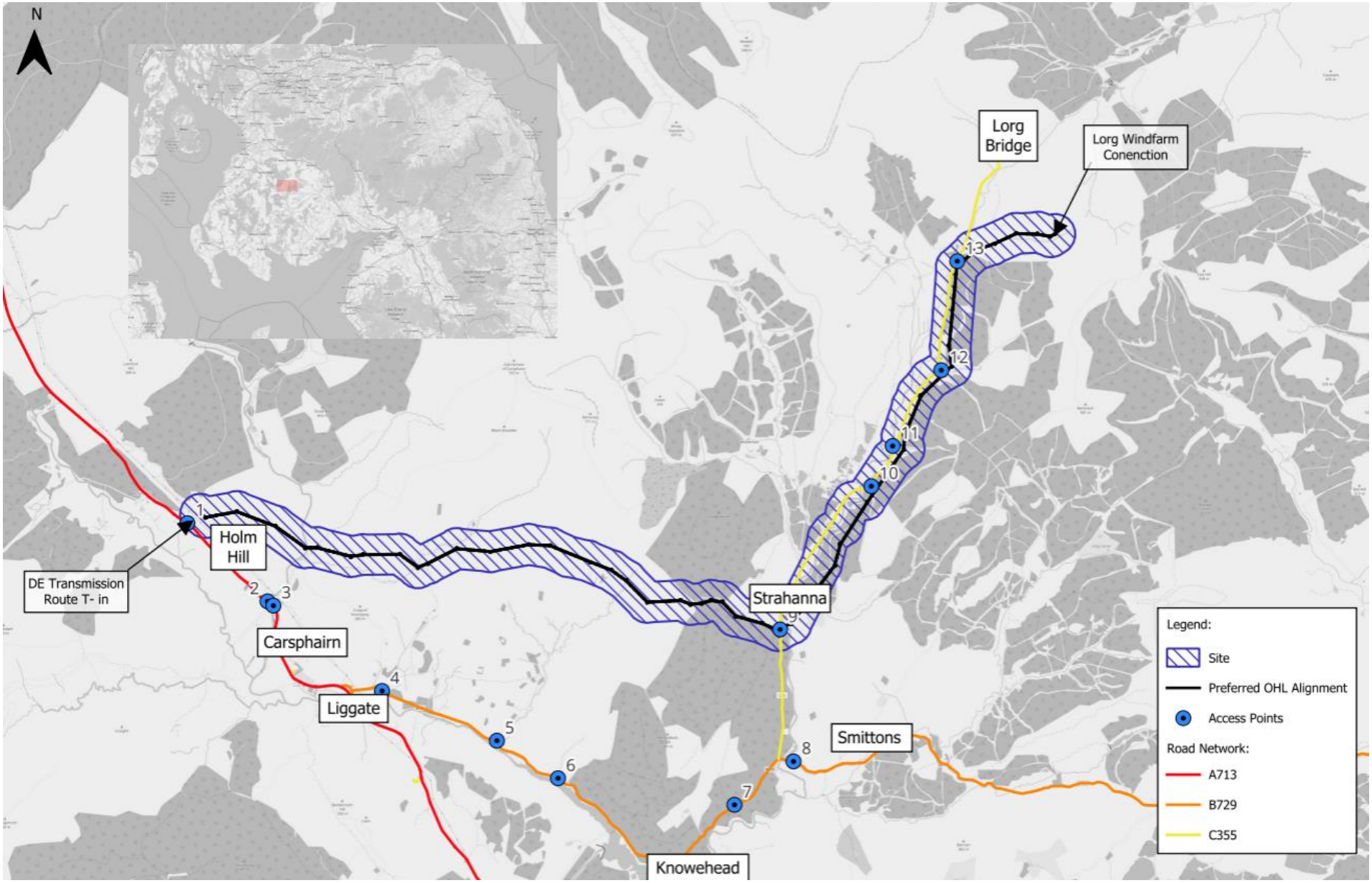
Plate 3.10 Junction Locations



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3.6.5 Twelve of these (labelled 2-13 on **Plate 3.10**) are included as part of this Section 37 application, and one (adjacent to Holm Hill, labelled 1 on **Plate 3.10**) will be included in the separate planning application for Holm Hill substation. It is anticipated that the majority of construction traffic would use the A713 to access the Site from the north. The A713 connects to the A77, which is part of the Trunk Road Network, at Ayr approximately 32 km north-west of the proposed access at Holm Hill substation. Vehicular access would be required to every pole location along the route during construction, access arrangements would be agreed with landowners and submitted as part of the full CTMP. This would be undertaken by the Principal Contractor.

3.6.6 It is anticipated that the Principal Contractor would identify a single main construction compound, with a safe area for parking away from the public road network for staff transport. It is anticipated that the majority of construction materials would be delivered to the construction compound where they would be distributed via the temporary accesses surrounding the Site (out with the public road network). Movements associated with aggregates or felling are assumed to be taken via the public road network.

3.6.7 It is anticipated that the largest possible items for transportation would be the cable drums for the OHL, which may need to be transported as Abnormal Indivisible Loads (AILs). Further detail on this can be found in **Appendix 3.1: Framework Construction Traffic Management Plan**.

3.7 Construction Environmental Management Plan

3.7.1 A CEMP would be produced by the Principal Contractor and implemented during construction of the Proposed Development, which would include measures to manage risks associated with nuisance and pollution and the potential risks posed to water, soils, air, human health and ecological receptors. It would be prepared in consultation with appropriate stakeholders and would include embedded construction good practice measures and additional mitigation. The CEMP would be submitted in advance of commencement of construction activities Dumfries and Galloway Council for approval, in consultation with Scottish Environment Protection Agency (SEPA).

3.7.2 The Applicant would appoint an ECoW onsite during the construction phase. The services of other specialist environmental advisors, such as an Archaeological Advisor, would be procured to support on specific environmental issues as required. The ECoW would ensure that the construction activities undertaken by Principal Contractor are carried out in accordance with the mitigation measures contained within the CEMP and any planning conditions relating to environmental matters, and this would be monitored by The Applicant.

3.7.3 The CEMP would be based on the Outline CEMP (Ref: SPT-ENV-FR-0006) submitted as part of the Section 37 application, which sets out the following embedded construction good practice measures. These measures are assumed to be in place prior to the assessment of effects reported in this EIAR:

- Protected Species Mitigation, including Otter, Badger, Bats, Common Reptile and Birds;
- Pollution Prevention;
- Drainage Management;
- Private Water Supply Protection;
- Dust Control and Management;
- Soil Storage and Management;
- Peat Management;
- Felling and Tree Management;
- Site Waste Management;
- Restoration and Reinstatement; and
- Construction Noise Management.

3.7.4 The development would be designed and constructed in line with sustainability principles including Biodiversity Net Gain (BNG). Wherever practicable, the resources required to construct the Proposed Development would be locally sourced.

3.8 Operation and Maintenance

3.8.1 The Proposed Development would be designed to have a minimum operational design life of 40 years.

3.8.2 The Proposed Development would be subject to a typical wayleave of 60 m, increasing to a maximum of 70 m for a short section around Corlea, to account for the steep side slopes in this location.

3.8.3 The Applicant would have ownership of and responsibility for maintenance activities for all elements of the Proposed Development. Whilst most OHL components are maintenance free, exposed elements which suffer from corrosion, wear, deterioration and fatigue may require inspection and periodic maintenance.

3.9 Decommissioning

3.9.1 When the operational life of the Proposed Development comes to an end, it is possible that the proposed OHL is reequipped with new conductors and insulators and the wood poles replaced. Alternatively, the OHL may be decommissioned fully, with the method of removal assumed to be as per the construction methods in reverse.

3.9.2 For the purposes of this EIAR, it is assumed the Proposed Development and associated operational environmental effects would be in perpetuity. Decommissioning is not proposed as part of the Proposed Development.

3.9.3 If the Proposed Development is decommissioned or refurbished, a further Environmental Impact Assessment (EIA) may be required to assess the environmental impacts associated with decommissioning or refurbishment as part of the consenting requirements at that time.