2 DESCRIPTION OF PROPOSED DEVELOPMENT

2.1 Introduction

2.1.1 This chapter provides a description of the Proposed Development for the purposes of identifying and assessing likely significant effects. The chapter provides:

- A description of the location of the Proposed Development;
- A description of the physical characteristics of the Proposed Development, including the land-use requirements during construction and operational phases;
- A description of the main characteristics of the operational phase of the development; and
- An estimate, by type and quantity of the expected residues and emissions produced during construction and operation phases.

2.1.2 The description of the main characteristics, including expected residues and emissions of the operational phase is made by reference to the typical activities associated with the operation of the Proposed Development. It is noted that there are no 'production processes' associated with this type of development and therefore there would be no ongoing operational use of energy, materials or natural resources.

2.1.3 The expected residues and emissions associated with the construction phase are described through reference to the typical activities associated with the construction and commissioning of the Proposed Development, as well as reinstatement of construction sites. **Table 2-4** provides a summary of the anticipated residues and emissions from the construction and operational stages of the Proposed Development.

2.1.4 This chapter is supported by the following figures and technical appendices:

- Volume 3a: Figures
  - **Figure 1.1: Location Plan and Overview;**
  - **Figure 2.1: Proposed Development;** and
  - **Figure 2.2: Land Take and Forestry Removal**.
- Volume 4: Technical Appendices
  - **Technical Appendix 2.1: Detailed Tower Schedule;**
  - **Technical Appendix 2.2: Outline Construction Environmental Management Plan (OCEMP);**
  - **Technical Appendix 2.3: SSEN Transmission General Environmental Management Plans (GEMP);** and
  - **Technical Appendix 2.4: SSEN Transmission Species Protection Plans (SPPs)**.

2.1.5 Details of the project needs are provided in **Section 1.1.1** of **Chapter 1: Introduction (EIAR Volume 2)**, and discussion of the routing and alignment process can be found within **Chapter 3: Consideration of Alternatives (EIAR Volume 2)**.

2.2 The Location of the Proposed Development

2.2.1 The Proposed Development is located between the proposed Creag Dhubh substation in Keppochan Forest and a connection point on the recently constructed Inveraray - Crossaig circuit, approximately 3.5 km north of Inveraray (**Figure 1.1: Site Location, EIAR Volume 3a**).

2.2.2 Starting from Creag Dhubh the Proposed Development runs south through commercial forestry, followed by open rough grazed land, and then back into an area of commercial forestry (**Figure 2.1: Proposed Development, EIAR Volume 3a**).

2.2.3 The Proposed Development is located entirely within the River Aray catchment and crosses a number of tributaries of the River Aray. There are a number of farm steadings located along the route of the Proposed Development, and the A819 runs parallel to the Proposed Development.

2.3 Characteristics of the Proposed Development

2.3.1 Scottish Hydro Electric Transmission plc (the Applicant) who, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission), own, operate and develop the high voltage electricity transmission system in the north of Scotland and remote islands, are seeking consent to construct and operate a 275 kV capable OHL connection (**Figure 2.1: Proposed Development, EIAR Volume 3a**) comprising:

- An approximately 9 km double circuit 275 kV OHL, supported by steel lattice towers between a proposed substation at Creag Dhubh (subject to a separate planning application) and the recently constructed Inveraray-Crossaig 275 kV capable OHL circuit.
- In addition to the above, there are ancillary works for the construction and maintenance of the OHL, including:
    - vegetation management including tree felling to create a safe operational corridor for construction and operation;
    - temporary OHL diversions to reduce circuit outages during the works;
    - the formation of bellmouths at public road access points;
    - construction of new temporary and permanent construction (stone) access tracks and the upgrade of existing tracks;
    - tower working areas, crane pads and winching positions; and
    - road and other infrastructure (bridges, culverts etc.) alterations.

2.3.2 The Proposed Development will replace the existing aged 132 kV OHL asset which will be dismantled between the proposed substation at Creag Dhubh and Inveraray and removed as part of the project works.

2.3.3 The proposed Creag Dhubh substation will be considered as part of the cumulative assessment (**Chapter 15: Cumulative Assessment, EIAR Volume 2**).

Indicative OHL Design

2.3.4 The Proposed Development would include the following key components:

- Thirty-four (34) self-supporting fabricated galvanised steel lattice towers, L8(C) series (**Plate 2.1**) that are on average 50 m high and separated by an average distance of 250-350 m. The spacing (span length) between towers and the tower height would vary depending on environment and engineering constraints with maximum height of approximately 60 m and maximum span length of 375 m. Specifications for all towers are presented in **Technical Appendix 2.1: Detailed Tower Schedule (EIAR Volume 4)**.

- An approximately 9 km (including connections at either end) double circuit 275 kV OHL supported by the towers. Each tower would carry two circuits, with three horizontal cross arms on each side of the tower, each carrying an insulator string and two conductors. An earth wire, containing an optical fibre ground wire (OPGW) would be strung between the tower peaks.

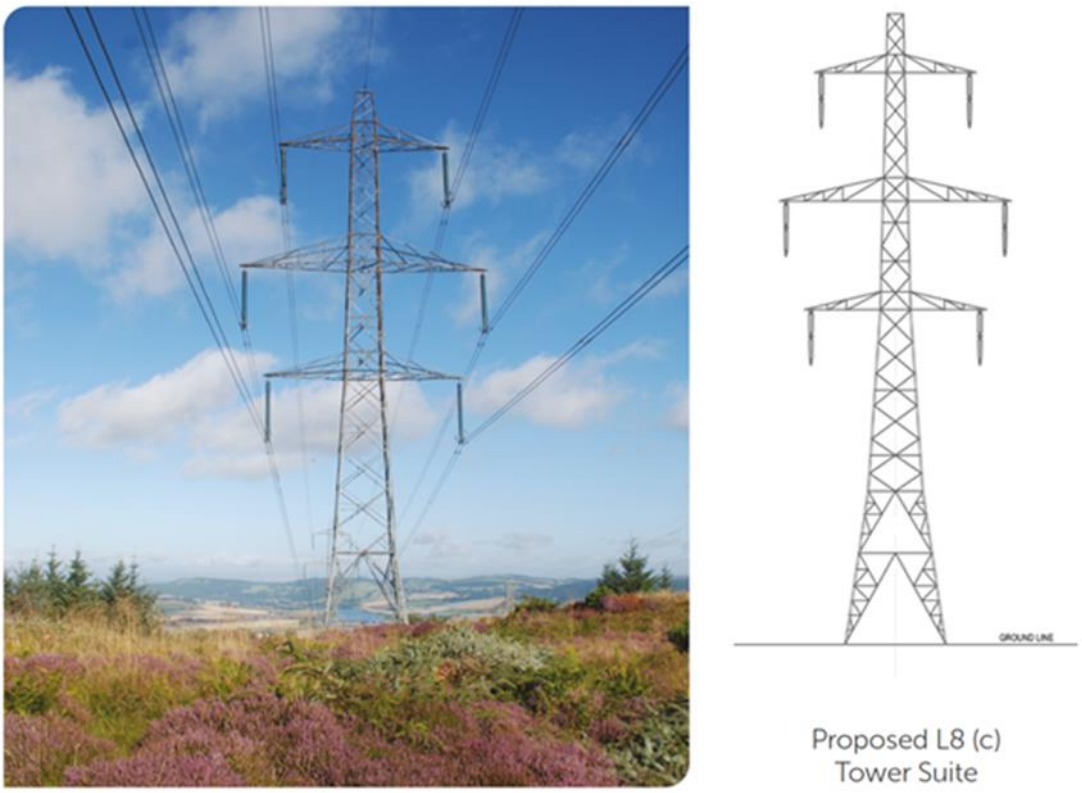

Plate 2.1: Transmission Tower Design

2.3.5 The Proposed Alignment that forms part of the Proposed Development has been determined based on the environmental assessments, engineering analysis, cost considerations and stakeholder consultation undertaken to date. The Proposed Alignment and detailed tower schedule (for the purposes of the application for consent) is provided in **Appendix 2.1: Detailed Tower Schedule (EIAR Volume 4) and on Figure 2.1: Proposed Development, EIAR Volume 3a**.

2.3.6 The Proposed Development would use 65.18 ha land as stated in **Table 2.1** of this chapter and presented in **Figure 2.2: Land Take and Forestry Removal (EIAR Volume 3a)**.

Limit of Deviation

2.3.7 The s37 application seeks consent for the construction and operation of the Proposed Development, based on the detailed tower schedule (**Appendix 2.1, EIAR Volume 4**) with a prescribed horizontal and vertical Limit of Deviation[1]. (LOD), to allow flexibility in the final siting of individual towers to reflect localised land, engineering, and environmental constraints.

2.3.8 Following consent, the investigation of sub-surface and geotechnical conditions at proposed tower locations would be undertaken and may result in the requirement for additional adjustments (micrositing) in the tower locations or heights. Hence, the Proposed Development for the purpose of

[1] Limit of Deviation, an area which defines the practical limits within which micrositing of the OHL infrastructure can occur within the terms of the s37 consent and deemed planning permission which are to be sought. The purpose of Limits of Deviation is to allow flexibility within a s37 consent for the final micro-siting and heights of individual towers to respond to localised ground conditions, topography, engineering, and environmental constraints.

this EIA is based on the Proposed Alignment and detailed tower schedule discussed above to allow for flexibility in the final siting of individual towers and access tracks.

2.3.9 The EIA has undertaken a worst-case assessment based on the agreed limits of deviation (LOD), as follows:

- The horizontal LOD parameter specified, allows towers and proposed access tracks to be relocated up to 100 m either side of the Proposed Development. The horizontal LOD for towers and access tracks is illustrated in **Figure 2.1: Proposed Development (EIAR Volume 3a**).
- The vertical LOD is up to 20% variation of the tower heights provided in the tower schedule (**Appendix 2.1: Detailed Tower Schedule, EIAR Volume 4**).

Land Take

Permanent Land Take

2.3.10 The Proposed Development including the LOD's as above comprise "the Site" for the purposes of the EIA. The Site is approximately 600 ha (**Figure 2.1: Proposed Development, EIAR Volume 3a**).

2.3.11 Within the Site the permanent land take would be limited to the Operational Corridor (OC) and the new permanent access tracks (plus 20 m felling buffer), which accounts collectively for about 10% of the total area within the Site.

2.3.12 The Proposed Development would result in the construction of approximately 8.34 km of new permanent track. A minimum running width[2] of 4.5 m is required for all access tracks. The total permanent land take area for the new tracks would be approximately 3.75 ha.

2.3.13 The Proposed Development also includes for the upgrade of 1.16 km of existing forestry track and the use of another 6.61 km of forestry track where upgrade is not required but maintenance of the track will be needed. The total permanent land take area for the existing tracks would be approximately 3.5 ha.

2.3.14 Further details on construction of the above elements are located in **Section 2.4** of this chapter.

Temporary Land Take

2.3.15 The Proposed Development would result in the construction of approximately 6.23 km of new temporary track. A minimum running width of 4.5 m is required for all access tracks. The total temporary land take area for the new tracks would be approximately 2.80 ha.

2.3.16 For the purposes of the EIA, it has been assumed that individual tower foundations and associated construction activities would require a working area of approximately 2500 m² (50 m x 50 m) for section towers and 6400 m² (80 m x 80 m) for angle towers. The exact dimensions of the working area around each tower would/ will be confirmed following micrositing.

2.3.17 Temporary diversions will be required to the existing transmission distribution network infrastructure which would be crossed by the Proposed Development. This will be between Towers T9 and T14, and between Towers T33 and T18 on the Inveraray-Crossaig circuit for the Tie-In connection. It is anticipated that these transmission distribution network assets would temporarily be diverted onto an OHL to make way for the Proposed Development and can be carried out under Permitted Development. The total temporary land take required for these diversions would be 15.37 ha.

2.3.18 Further details on construction of the above elements are outlined in **Section 2.4** of this chapter.

[2] The useable road surface, clear of signs, drains and safety barriers.

2.3.19 The area of temporary and permanent land take associated with the Proposed Development is presented in **Table 2-1**.

Table 2-1: Summary of Temporary and Permanent Land Take

Project Construction Element	Temporary (ha)	Permanent (ha)
Operational Corridor (felling: 85 m or 60 m corridor dependent on nature of woodland)	-	24.97
Tower Platform working areas (50 m x 50 m for line towers, or 80 m x 80 m for angle towers)	13.18	-
On-site access tracks (new)	2.80	3.75
On-site access tracks (existing upgrade)	-	0.52
On-site access tracks (existing maintained)	-	2.98
Felling for access tracks (20 m corridor)	-	1.85
Management felling	-	14.88
Temporary diversions	15.37	-
TOTAL (ha)	31.35	48.95
TOTAL LAND TAKE (temp and perm, ha)	**80.30**	

2.4 Construction Activities and Phasing

2.4.1 It is anticipated that the construction of the Proposed Development would commence in 2024 (subject to consents and approvals being granted). A provisional construction period of 43 months is anticipated, with energisation of the Proposed Development scheduled for 2027.

2.4.2 The construction programme would comprise four key phases shown in the indicative construction programme in **Table 2-2** and discussed in the sections below.

2.4.3 The detailed construction phasing and programme would be subject to change as the design progresses and also following the grant of the necessary consents, and wayleaves being obtained.

Table 2-2: Indicative 43 month Construction Programme (2024-2027)

Task*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
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*Tasks

1. Forestry Felling
2. Access Track Construction
3. Site Mobilisation
4. OHL Installation Works
5. Tower Installation Works
6. OHL Outage Connection Works
7. Site Reinstatement
8. Tower Demolition/ Dismantling

Phase 1 – Enabling Works

Existing Network Diversions

2.4.4 Works would be required to the existing transmission network infrastructure which are crossed by the Proposed Development. The following two areas are where the Proposed Development crosses existing services:

- Near Tower T11: the Proposed Development crosses the existing Inveraray to Taynuilt East/ Inveraray to Taynuilt West 132 kV OHL (ITE/ITW); and
- Near Tower T34: the Proposed Development connects to the existing Inveraray-Crossaig circuit and a temporary diversion will be required.

2.4.5 The Proposed OHL is required to oversail the existing 132 kV ITE/ITW OHL (ITE/ITW) due to topographical and clearance constraints. To ensure security of supply on the ITE/ITW and to ensure safe stringing of the Proposed Development over the ITE/ITW, it is required to be diverted on to wood poles to allow sufficient clearance between the different sets of conductors. The temporary diversion on the ITE/ITW will be from Tower T23 to Tower T26. Between these two structures, each existing circuit will be transferred on to wood poles and energised at 132kV. The temporary diversion will consist of the following:

- 18 Double wood pole structures (nine structures for each circuit); and
- Approximately 1.64 km of new 132kV conductor covering both diverted circuits.

2.4.6 The temporary diversion of the ITE/ITW will be removed on completion of the works along with the other structures and conductors due to be removed.

2.4.7 Where the Proposed Development connects to the existing Inveraray-Crossaig OHL, a new tower, Tower 34, will be constructed immediately north of existing Tower IDW/IAE 17 (previously named IC15R) on Inveraray-Crossaig OHL. The west of the circuit will be diverted on to a temporary tower and later connected to the Proposed Development. At a time when the east circuit is ready to be commissioned (approximately 2027), the east circuit of Inveraray-Crossaig OHL will be connected to the Proposed Development and operated at 275 kV. The temporary tower and existing Tower IDW/IAE 17 will then be dismantled, allowing for the Proposed Development to connect the proposed Creag Dhubh substation to the Inveraray-Crossaig Circuit.

2.4.8 The new conductors will connect the Proposed OHL onto the existing Inveraray-Crossaig OHL at Tower T18. The existing Inveraray-Crossaig OHL, Tower T17 will be removed to facilitate the connection of the Proposed OHL onto the existing Inveraray- Crossaig OHL. Due to the technical requirements, new conductors have to be strung back to the last angle/tension tower on the existing Inveraray-Crossaig OHL. Therefore, new conductors will have to connect onto the existing Inveraray-Crossaig OHL at Tower T19. The conductors between the existing Inveraray-Crossaig OHL Tower T18 and Tower T19 will be a like for like replacement of these existing spans. The new and final arrangement will result in a new span between the Proposed Development Tower T34 and the existing Inveraray-Crossaig OHL Tower T18.

2.4.9 This results in the following sections of new/replacement conductors:

- An additional 9 km of new 275kV OHL between OHL gantries inside Creag Dhubh substation boundary and to the existing Inveraray-Crossaig OHL Tower T17 which is due to be removed.
- The span between existing Inveraray-Crossaig OHL Tower T18 and Tower T17 is due to be replaced with a span from existing Inveraray-Crossaig OHL Tower T18 to the Proposed Development Tower T34. This results in 0.32 km of existing conductors being replaced.

- The span between existing Inveraray-Crossaig OHL Tower T18 to Tower T19 will also be replaced as part of the required stringing works. This results in the replacement of 0.4 km of existing conductors.
- This requires a total length of new/replacement conductor of 9.72 km from Creag Dhubh substation to existing Inveraray-Crossaig OHL Tower T19.

2.4.10 To enable the connection of the Proposed OHL in to the existing Inverary-Crossaig OHL in such a manner that enables supply to be maintained on the existing Inverary-Crossaig OHL, the Proposed OHL must be connected in stages. The west circuit on the existing Inveraray-Crossaig OHL is to be connected first. To facilitate this connection and a temporary single circuit tower is to be constructed to the west of the Proposed Development Tower T34. This will be connected to the existing Inveraray-Crossaig OHL Tower T18 and the Proposed Development Tower T33 by approximately 720 m of single circuit conductor. This arrangement allows the west circuit to be energised to 275 kV and enables the safe construction of the Proposed Development Tower T34. When the east circuit is to be energised, both circuits will be connected on to the Proposed Development Tower T34 and both the temporary tower and existing Inveraray-Crossaig OHL Tower T17 will be removed to enable to final arrangement.

Vegetation Management and Forestry Clearance

2.4.11 The Proposed Development navigates areas of commercial forestry, where an OC would be required to be cleared. The width of this OC will be variable depending on the nature of the woodland[3], with an average corridor of 85 m required (42.5 m either side of the tower centre line). This OC will be reduced to 60 m (30 m either side of tower centre line) for areas of broadleaf woodland. In addition, minor vegetation management and felling (20 m OC) would be required around the existing and proposed access track network to provide sufficient width. The total area of woodland removal is 41.70 ha (**Figure 2.2: Land Take and Forestry Removal, EIAR Volume 3a**). Further details are provided in **Chapter 14: Forestry (EIAR Volume 2)** and the associated appendices (**Appendices 14.1 – 14.3 EIAR Volume 4**). **Chapter 14** also sets out the methodology that will be followed to limit the removal of Ancient and Native Woodland.

Road Improvements and Access

2.4.12 Access tracks that would service the construction and operation of the Proposed Development, are shown in **Figure 2.1: Proposed Development (EIAR Volume 3a).** The Principal Contractor(s) may refine access tracks based on the plans provided above (any tracks outwith the LOD would require separate planning permission). In general, based on desk study analysis and preliminary walkover inspections, access will be established through a combination of:

- upgrades to existing tracks (1.16 km);
- maintenance to existing tracks (6.61 km);
- installation of temporary new stone tracks (6.23 km); and
- installation of permanent new stone tracks (8.34 km).

2.4.13 Permanent access would be required in the form of stone access tracks for all angle towers[4]. Where possible, existing tracks would be used or upgraded for use. In other locations (e.g., to access section towers[5]), it is anticipated that new temporary tracks would be installed. A minimum running

[3] The width of the Operational Corridor is dependent on the mature growth height of trees and topography adjacent to the OHL.
[4] Support structure (tower or pole) which allows a change in direction of the overhead line.
[5] Theses towers run the straight line routes where the angle deviation is less than 5 degrees. Like all transmission lines, the suspension towers have conductors attached to the lines. Numerous structure variations exist on suspension towers.

width of 3.4 – 4.5 m is required for all access tracks. Floating stone road or trackway panel construction may be installed in sensitive areas such as over peat (**Chapter 10: Geology and Soils, EIAR Volume 2**), depending on the sensitivity of constraints identified and the engineering feasibility of installing this type of track. All new constructed tracks would be constructed to good practice working methods[6],[7],[8],[9],[10],[11] with watercourse crossings designed and constructed to comply with legislation set out in The Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended.

Site Compounds

2.4.14 Construction compound sites (temporary/permanent) have not been identified at this stage. This will be the responsibility of the Principal Contractor(s), who will identify suitable sites and apply for separate planning permission.

Phase 2 – OHL Construction

Tower Foundations

2.4.15 Different approaches to forming foundations may be used, subject to ground conditions at each tower location. These would likely comprise:

- Spread type e.g., concrete pad and chimney;
- Piled type e.g., driven concrete, tube, and micro pile; or augered.

2.4.16 Foundation types and designs for each tower would be confirmed following detailed geotechnical investigation at each tower position.

2.4.17 Dimensions of each foundation would be confirmed following micrositing. For the purposes of this assessment however it has been assumed that each foundation would be buried to depths estimated up to 2.5 m below ground level (bgl) although extending up to 4 m depth where ground conditions require. They would extend over an area suitable to deliver the loading characteristics required (which would be a function of the underlying ground conditions and the weight of the structures to be supported). Piled foundations may be required where low strength ground conditions exist, particularly where peat is encountered at over 1.5m depth.

2.4.18 For the purposes of the EIA it has been assumed that individual tower foundations and associated construction activities would require a working area of approximately 2500 m^2 (50 m x 50 m) for section towers and 6400 m^2 (80 m x 80 m) for angle towers. The exact dimensions of the working area around each tower would/will be confirmed following micrositing.

2.4.19 Where encountered, top soil (including peat, vegetation, and turves) would be stripped from the tower working area to allow installation of tower erection pad(s) as necessary to accommodate construction plant and stored in accordance with good practice as per the Outline Construction Environmental Management Plan (OCEMP) (**Appendix 2.2, EIAR Volume 4**) and the SSEN Transmission's General Environmental Management Plans (GEMPs) (**Appendix 2.3 EIAR Volume 4**). Concrete would be brought to Site ready-mixed with no requirement for concrete batching at individual tower

[6] Forestry Commission (2011). Forests and Water. UK Forestry Standard Guidelines. Forestry Commission, Edinburgh. i–iv + 1– pp.
[7] Forestry Commission (2014) Forest Commission Road Specification, April 2014, URL: http://www.forestry.gov.uk/forestry/infd-6emgrz
[8] Scottish Natural Heritage (2015) Good Practice During Wind Farm Construction, A joint publication by Scottish Renewables, SNH, SEPA, Forestry Commission Scotland and Historic Scotland, 3rd Edition.
[9] CIRIA Publications 2006: Control of Water Pollution from Linear Construction Projects. Site Guide (C649).
[10] Scottish Natural Heritage (2013) Constructed Tracks in the Scottish Uplands, 2nd Edition.
[11] Forestry Commission Scotland and Scottish Natural Heritage (2010) Floating Roads on Peat.

locations. Once the concrete has been cast and set, the excavation would be backfilled, using the original excavated material where possible.

2.4.20 It is anticipated that formation of each tower foundation would take approximately four weeks.

OHL Construction

2.4.21 Tower construction can commence two weeks after the foundations have been cast, subject to weather conditions and concrete curing rates. Tower steelwork would be delivered to each tower construction site either as individual steel members or as prefabricated panels, depending on the method of installation and the available access.

2.4.22 Each tower would be assembled on-site into panels by a team of up to eight people. The lower tower panels may be erected using a telehandler, but upper panels would normally be erected into position using an all-terrain crane. Where access is not available for a crane, a derrick would be used. Most towers would be assembled within about five days each and erected by crane in one to two days depending on weather conditions and tower type. Large angle or terminal towers, or towers within restricted sites may take longer.

Conductor Stringing

2.4.23 The conductor would be delivered to Site on wooden drums in pre-determined pulling section lengths. Typical drum lengths for conductors are up to a maximum 2,400 m (approximate weight of 4 tonnes) but would depend on the specific length of section to be strung.

2.4.24 Prior to stringing the conductors, temporary protection measures, (e.g., netted scaffolds) would be erected across public roads and existing access tracks.

2.4.25 Conductor stringing equipment including winches, tensioners and ancillary equipment would be set out at either end of pre-selected sections of the OHL. Pilot wires would be pulled through the section to be strung. These would be hung in blocks (wheels) at each suspension tower in the section and connected to a winch and tensioner at the respective end of the section. The winch, in conjunction with the tensioner would be used to pull the pilot wires which would be connected to the conductor at the tensioner end. The conductor would be pulled via the pilot wires through the section and under controlled tension to avoid contact with the ground and any under-running obstacles including protection scaffolds. Once the conductor has been strung between the ends of the section it would then be tensioned to provide the necessary sag and then permanently clamped at each tower.

2.4.26 Dependent on terrain or site constraints pilot wires can be pulled through either with the use of all-terrain vehicles, tractors, or helicopters.

Phase 3 – OHL Commissioning

2.4.27 The OHL and support towers would then be subject to an inspection and snagging process. This allows the Contractor and SSEN Transmission 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 proposed substation at Creag Dhubh. The circuits would then be energised.

Phase 4 – Reinstatement

2.4.28 Following commissioning of the Proposed Development, all construction sites would be reinstated. Reinstatement would form part of the contract obligations for the Principal Contractor(s) and would include the removal of all temporary access tracks, all work sites around the tower locations and the re-vegetation of all construction compounds. The Principal Contractor(s) would be required to provide a Reinstatement Plan prior to reinstatement works commencing.

2.5 Construction Employment and Hours of Work

2.5.1 The Applicant considers it important to act as a responsible developer with regards to the communities which host the construction works. The delivery of a major programme of capital investment provides the opportunity to maximise the support of local communities. Employment of construction staff would be the responsibility of the successful Principal Contractor(s); however, the Applicant encourages the successful Principal Contractor(s) to make use of suitable labour and resources from areas local to the location of the Proposed Development.

2.5.2 It is envisaged that there will be a number of separate teams working at the same time at different locations within the Site. The resource levels will be dependent on the final construction sequence and will be determined by the successful Principal Contractor(s).

2.5.3 Construction activities would in general be undertaken during daytime periods only. For weekdays, this would involve work between approximately 07:00 to 19:00 in the summer and 07:30 to 17:00 (or as daylight allows) in the winter. On Saturday the working hours would be approximately 07:00 to 17:00 in the summer and 07:30 to 17:00 (or as daylight allows) in the winter.

2.5.4 Any variation in these working hours would be agreed in advance with Argyll and Bute Council (ABC).

2.6 Construction Traffic and Plant

2.6.1 Construction of the Proposed Development will give rise to regular numbers of staff transport movements, with small work crews travelling to work site areas. It is anticipated that the Principal Contractor(s) will identify a main compound, with a safe area for parking.

2.6.2 Vehicle movements will be required to construct new permanent and temporary access tracks, upgrade existing access tracks, deliver the foundation, and tower components and conductor materials to site and deliver and collect materials and construction plant from the main site compound and to individual tower locations.

2.6.3 The successful Principal Contractor(s) would determine where access is required, and for which items of plant, and prepare Construction Traffic Management Plans (CTMP) in consultation with the Applicant and the Local Authority. The CTMP would describe all mitigation and signage measures that are proposed on the public road accesses based on access maps and subsequent site assessments.

2.6.4 Temporary traffic management may be required at some locations (e.g., to facilitate construction material deliveries). For minor tracks and other crossings, the installation of appropriate warning signs and provision of staff with stop / go boards to control any passing traffic may be adequate. Traffic Management requirements will be identified within the CTMP and agreed with the Local Authority.

2.6.5 Construction traffic would comprise construction staff in private cars, and HGVs/LGVs carrying construction materials, personnel and plant equipment. The source of construction materials is unconfirmed at this stage; however, based on the layout of the local road network it can be assumed that construction traffic (HGVs and staff) would approach the Site from both north and south via the A85 (T) and A83 (T) respectively and A819.

2.6.6 An indicative 43 month construction programme established that the Proposed Development would generate the most construction activity during month six of the construction programme and results in 114 daily movements. Of these, 74 movements are associated with HGV moving equipment to mobilise sections of the works as well as the import of track building materials from local quarries. The remaining 40 movements are associated with construction staff arriving at and departing from

the Site. Further details on vehicle movements are provided in **Chapter 12: Traffic and Transport (EIAR Volume 2)**.

2.7 Standard Mitigation and Working Methods during Construction

Outline Construction Environmental Management Plan (OCEMP)

2.7.1 An OCEMP (**Technical Appendix 2.2, EIAR Volume 4)** has been prepared to set out the approach towards, and framework for, environmental management during the construction phase (including site preparation) and to provide mitigation against potentially adverse construction impacts on environmental resources, and local residents. This OCEMP will be further developed and implemented by the Principal Contractor(s). This document would detail how the Principal Contractor(s) would manage the Site in accordance with all commitments and mitigation detailed in this EIA Report, statutory consents and authorisations, and industry best practise and guidance. **Chapter 16: Schedule of Environmental Mitigation (EIAR Volume 2)** states all mitigation measures included in this report.

2.7.2 The final CEMP would also reference SSEN Transmission's General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs). The implementation of the CEMP would be managed on-site by a suitably qualified and experienced Ecological Clerk of Works (ECoW), with support from other environmental professionals as required.

General Environmental Management Plans (GEMPs)

2.7.3 GEMPs have been developed by the Applicant which cover legislation and compliance requirements for a range of impacts such as dust management and biosecurity and would be referenced in the CEMP. Details of the relevant GEMPs are provided in **Technical Appendix 2.3 (EIAR Volume 4)**.

Species Protection Plans (SPPs)

2.7.4 SPPs have been developed by the Applicant and have been agreed with NatureScot. Details of the relevant SPPs are provided in **Technical Appendix 2.4 (EIAR Volume 4)**.

Water Crossings

2.7.5 **Technical Appendix 11.1: Water Crossing Assessment (EIAR Volume 4)** includes information on the management of construction work where there will be interaction with watercourses. A total of 60 potential watercourse crossing points (**Technical Appendix 11.1, Figure 11.1.1, EIAR Volume 4**) have been identified for the proposed access tracks, some of which are existing crossings.

Peat Management

2.7.6 **Technical Appendix 10.2: Outline Peat Management Plan (EIAR Volume 4)** outlines the proposed working methods where the excavation of peat would be required and provides further details on potential volumes of peat excavated and the likely requirements for reinstatement.

2.7.7 **Technical Appendix 10.3: Peat Landslide Hazard Risk Assessment (EIAR Volume 4)** provides further technical information on the likely risk and hazards associated with peat instability, and the proposed standard mitigation and working methods that would be implemented during construction to seek to avoid adverse effects associated with peat instability.

2.8 Mitigation Through Design

2.8.1 The Proposed Alignment of the Proposed Development has responded, where possible, to comments and concerns raised during the consultation process (**Chapter 4: Consultation and**

Scoping, EIAR Volume 2) and is considered to represent a balance between environment, engineering, and cost factors.

2.8.2 As described in **Chapter 3: Consideration of Alternatives (EIAR Volume 2)** the routeing and alignment processes have facilitated the effective mitigation of many potentially significant environmental effects through the design. A summary of the potential effects addressed through the routeing process and the issues remaining following the selection of the Proposed Alignment is provided in **Table 2-3**.

Table 2-3: Mitigation Achieved Through Design

Topic	Mitigation	Further Assessment
Landscape and Visual Impact Assessment and Residential Visual Amenity Assessment	The Proposed Development is not routed through any nationally designated landscapes. It is not located within an Area of Wild Land. The alignment process identified the Proposed Alignment as preferable. Although it sits slightly higher within the valley below Cruach Mhor, and passes near several properties, the alignment branches away from dwellings, and local topography and forestry will provide a degree of screening for dwellings and at other visual receptor locations including roads and the Ben Lui Wild Land Area (WLA).	**Chapter 6: Landscape and Visual Amenity** provides an assessment of potential effects of the Proposed Development on landscape character and visual amenity.
Cultural Heritage	The Proposed Alignment passes through the northernmost part of Inveraray Castle Garden and Designated Landscape (GDL) (characterised by woodland) but avoids listed buildings within the GDL.	**Chapter 7: Cultural Heritage** provides an assessment focussed on identifying the likely significant indirect (setting) effects on cultural heritage assets.
Ecology	Detailed habitat surveys have been carried out for the EIA. During the alignment phase the three main habitat types were identified as coniferous plantation woodland (in various stages of planting and harvesting), broad-leaved woodland (much of which is considered to be Ancient Woodland) and areas of open upland grazing, likely comprising of marshy and semi-improved acid grasslands. During the alignment stage the Proposed Alignment was selected as it avoided the loss of Ancient Woodland. Further pre-construction surveys will be completed where identified through the EIA process, informing appropriate mitigation prior to construction.	**Chapter 8: Ecology** assesses the potential effects on terrestrial habitats and protected species, including nearby protected sites, Annex 1 habitats, such as blanket bog and wet heath, and protected species, such as badger and bats. As stated in **Chapter 1**: **Introduction**, a full Biodiversity Net Gain (BNG) report will be prepared, detailing the biodiversity baseline, along with the biodiversity impacts and changes due to the construction works and permanent development. The report will state whether the development will result in a net loss, no net loss, or a net gain in biodiversity, with recommendations to further minimise biodiversity impacts and maximise biodiversity outcomes. The final BNG report will be submitted after the submission of the final EIAR. The BNG assessment is based on definitive numbers and takes approximately three weeks to complete. Therefore, submitting the assessment after the EIAR submission reduces the

Topic	Mitigation	Further Assessment
		likelihood of any further changes being made to the design and the need to re-run the assessment process.
Ornithology	The Proposed Alignment is within 100 m of the western edge of the Glen Etive and Glen Fyne Special Protection Area (SPA). This is used by Schedule 1/1A bird species. Field surveys were undertaken in two phases, with Vantage Point (VP) surveys undertaken between February 2018 and January 2019 as well as March 2021 to April 2022. The 2018-19 VP surveys were designed to cover a wider survey area to assist with the routeing study, as it was intended to be undertaken in 2018. These surveys were undertaken from eight VP locations. The 2021-22 VP surveys were undertaken from similar VP survey locations to the 2018-19 surveys.	**Chapter 9: Ornithology** assesses the potential for significant effects on ornithological features. The likely direct, indirect, and cumulative effects of the Proposed Development on these features have been assessed and mitigation measures, where appropriate, are proposed to prevent, reduce, or offset any likely significant adverse effects identified. Potential disturbance of golden eagle territories within the Glen Etive and Glen Fyne SPA is assessed in more detail in **Technical Appendix 9.3: Habitat Regulations' Appraisal (EIAR Volume 4).**
Geology and Soils	Stage 1 and 2 peat probing surveys have been undertaken, to understand peat depths along the Proposed Alignment. This has informed the access track design and identified areas were micrositing may be required.	**Chapter 10: Geology and Soils** provides an assessment of potential effects of the Proposed Development on peatland habitats and geology.
Hydrology and Hydrogeology	The Proposed Alignment has avoided where possible, development within 30 m of watercourses, avoiding direct effects on surface watercourses. The Proposed Development would incorporate good practice drainage design during construction and operation, using multi-tiered sustainable drainage system (SUDS) approach to control the rate, volume, and quality of run-off from the Proposed Development. Foundation works and constructed tracks would be constructed to standard good practice working methods and would comply with legislation such as The Water Environment (Miscellaneous) (Scotland) Regulations 2017. The potential for effects on hydrological features during construction will be strictly controlled in accordance with a detailed CEMP.	**Chapter 11: Water Environment** provides an assessment of potential effects of the Proposed Development on the water environment. It is supported by the following Technical Appendices in **EIAR Volume 4**: • **Technical Appendix 11.1: Watercourse Crossing Assessment;** • **Technical Appendix 11.2: Groundwater Dependent Terrestrial Ecosystem Assessment;** • **Technical Appendix 11.3: Private Water Supply Assessment; and** • **Technical Appendix 11.4: Forestry Hydrology Assessment.**
Forestry	Alignment decision have been made to seek to minimise direct effects on all woodland and avoid Ancient Woodland.	**Chapter 14: Forestry** provides an assessment of the proposed felling required to facilitate the creation of an OC for the Proposed Development and implications for forest/land-use management.

Topic	Mitigation	Further Assessment
		Potential significant effects associated with woodland removal activities will also be assessed in the following EIA Chapters: **Chapter 6: Landscape and Visual, Chapter 7:Cultural Heritage, Chapter 8:Ecology, Chapter 9: Ornithology** and **Chapter 11:Water Environment**.

2.9 Operation Management and Maintenance

Maintenance Programme

2.9.1 In general, given the nature of the Proposed Development, there would be a negligible or no demand for energy, materials, or natural resources during the operational life of the OHL. OHLs require very little maintenance.

2.9.2 Regular inspections would be undertaken to identify any unacceptable deterioration of components, so that they can be replaced. From time to time, inclement weather, storms, or lightning can cause damage to either the insulators or the conductors. If conductors are damaged, short sections may have to be replaced. Insulators and conductors are normally replaced after about 40 years, and towers painted every 15-20 years.

Managed Operational Corridor

2.9.3 In addition to the removal of vegetation to facilitate construction it is necessary to create safe corridors for operation. The typical operational corridor required within areas of commercial forestry is 85 m (reduced to 60 m in certain areas). The OC is defined with reference to the distance at which a tree could fall and cause damage to the OHL, resulting in a supply outage[12]. As a result, the final corridor width would be based on the safety distance required to allow for a mature tree falling towards the OHL at the mid-point on a span between two towers, taking account of topography and tree height at maturity. Periodic vegetation management within the operational corridor will also be required throughout the operational lifetime of the Proposed Development. A felling corridor (20 m) will also be required around permanent access tracks.

2.10 Use of Natural Resources

2.10.1 The EIA Regulations require the consideration of the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources. The Proposed Development would use approximately 65.18 ha land as presented in **Figure 2.1: Proposed Development (EIAR Volume 3a)**. Other than the change of land use, given the nature of the Proposed Development (i.e., there are no production processes), there would be a negligible or no demand for natural resources during the operational life of the Proposed Development and therefore no likely significant effect on the sustainable availability of such resources.

[12] As specified by the 'red zone' set out in paragraph 39 of the Forest Industry Safety Accord (2013) Electricity at work: Forestry, FISA Safety Guide 804: URL: https://www.ukfisa.com/assets/files/safetyLibrary/FISA%20804%20-%20Electricity.pdf

2.11 Residues and Emissions

2.11.1 The EIA Regulations require that the EIA Report provides an estimate, by type and quantity, of expected residues and emissions (such as water, air and soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced) resulting from the construction and operation of the Proposed Development.

2.11.2 **Table 2-4** provides a summary of the anticipated residues and emissions, which have been used to inform the scope of this EIA.

Table 2-4: Residues and Emissions

Topic	Potential Residue / Emission
Water	Construction: Surface water runoff and discharge is likely during construction. In addition, occasional discharges may arise from pumping, or over-pumping to dewater foundation excavations. Pollution sources may arise from soil erosion or oil/ fuel or chemical storage and use. All works in and around watercourses will follow best practice guidance and Outline CEMP (**Technical Appendix 2.2, EIAR Volume 4**). Further details can be found in **Chapter 11: Water Environment, EIAR Volume 2).** Operation: No water emissions or pollution sources have been identified for the operational phase.
Air	Construction: The construction phase would require the transport of people and materials by road and air, with associated emissions to the atmosphere. There are no air quality management areas within the vicinity of the Proposed Development. No significant air emissions are anticipated. Operation: Due to the nature of the Proposed Development no significant point source or diffuse air emissions would be produced during its operation. The Proposed Development would contribute to connecting renewable electricity generation capacity to the transmission network, in turn displacing emissions associated with fossil fuel based electricity generation elsewhere.
Soil and Subsoil	Construction: Soil and subsoil excavation, handling and storage would be required during construction. All soil and subsoil would be stored temporarily for use in reinstatement (**Appendix 2.3: SSEN GEMP, EIAR Volume 4**). Operation: No requirement for soil or subsoil excavation or handling during the operation phase has been identified. No pollution sources have been identified for the operational phase.
Noise and Vibration	Construction: Noise sources during the construction phase would include increased traffic flows and noise from construction plant. Further detail is provided in **Chapter 13: Noise and Vibration (EIAR Volume 2).** There would be no significant vibration emissions associated with the Proposed Development. Operation: Noise emission levels from a 275 kV OHL are unlikely to be perceptible during dry weather, however perceptible noise can arise in wet weather. Further detail on the proposed scope of operational noise assessment is provided in **Chapter 13: Noise and Vibration (EIAR Volume 2).**

Topic	Potential Residue / Emission
Light	Construction: The temporary construction compounds are likely to be equipped with lighting installations for use during low light conditions and passive infra-red sensor controlled security lighting. Any effect would be temporary and not expected to be significant. Operation: No light sources have been identified during normal operation of the Proposed Development.
Heat and Radiation	Construction: No heat or radiation sources have been identified during the construction phase. Operation: Electromagnetic fields (EMFs) are emitted from OHLs, with potential effects on human health.
Waste	Construction: The construction stage will require felling of woodland. As such, it is anticipated that forestry related residues (brash and mulch) would result from the felling operations. Further detail on forestry is provided in **Chapter 14: Forestry (EIAR Volume 2).** Construction will generate general waste in the form of domestic wastes and other materials, for example, wood, metals, plastics, and stone. Waste will be managed in accordance with good practice guidance on the use of a Site Waste and Materials Management Plan[13], to implement the waste management hierarchy[14]. Operation: Electricity transmission does not produce any physical waste. However, the general maintenance of the Proposed Development has the potential to produce a small amount of waste. This is likely to be restricted to waste associated with employees and visiting contractors.

2.12 Disaster Resilience

2.12.1 The EIA regulations require the consideration of the potential risks to human health, cultural heritage or the environment associated with the vulnerability of the Proposed Development to major accidents and disasters. This requirement is interpreted as requiring the consideration of low likelihood but high consequence events which would result in serious harm or damage to environmental receptors.

2.12.2 Given the nature of the Proposed Development, the potential for risks related to the vulnerability to major accidents and disasters are likely to be limited to those associated with unplanned power outages, due to extreme weather or structural damage.

2.12.3 Relevant types of accident/disaster, given the predominantly rural context of the Proposed Development, include:

- severe weather events, including high winds, high rainfall leading to flooding, or extreme cold leading to heavy snow and ice loading;
- wild fire;
- traffic related accidents; and

[13] URL: https://www.netregs.org.uk/environmental-topics/waste/storage-handling-and-transport-of-waste/site-waste-management-plans-swmp/ [Accessed June 2022]

[14] Scottish Government (2017) Applying the waste hierarchy: guidance: URL https://www.gov.scot/publications/guidance-applying-waste-hierarchy/pages/3/#:~:text=The%20waste%20hierarchy%20ranks%20waste,the%20lifecycle%20of%20the%20material.&text=When%20waste%20is%20created%2C%20it,all%20disposal%20(i.e.%20landfill) [Accessed June 2022].

- mass movement associated with ground instability.

2.12.4 Severe weather resilience is a core component to the network design, and includes consideration of flooding resilience, overhead OHL and continuity plans are in place across the SSEN Transmission network. These are tested regularly and are designed for the management of, and recovery from, significant energy infrastructure failure events. Where there are material changes in infrastructure (or the management of it) additional plans are developed.

2.13 Decommissioning

2.13.1 The Proposed Development would not have a fixed operational life. It is assumed that the Proposed Development would be operational for 50 years or more. The effects associated with the construction phase can be considered representative of worst-case decommissioning effects, and therefore a separate assessment of decommissioning effects is not provided as part of this EIA Report.