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2. PROJECT DESCRIPTION

2.1 Introduction

This chapter provides a description of the main elements of the Proposed Development.

2.2 Proposed Development

The Proposed Development is located approximately 9.5 km north east of Bonar Bridge. The specific location of the proposed Carnaig 400 kV Substation (hereafter referred to as the 'the Site') is adjacent to the south western boundary of the existing 275 kV Loch Buidhe Substation at central grid reference NH 65053 97458. The Site is located within an area of commercial forestry, which has been partially felled. Lochbuie Road runs to the west of the Site.

The Proposed Development consists of:

- Two new bellmouths and access roads to the Proposed Development from the public highway;
- One new bellmouth and access road from the Proposed Development to the private forestry track;
- A temporary construction compound;
- Drainage and associated SuDS retention basins;
- A new level platform (approximately 530 m by 324 m) to be delivered through cut and fill earthworks. An outdoor AIS, 400 kV substation complete with 400 kV double busbar arrangement;
- Installation of three new SGTs and other associated equipment;
- A new substation control building (approximately 23 m by 48 m by 5.8 m);
- Four Synchronous condenser buildings (approximately 33 m by 32 m by 14.5 m);
- Erection of a 2.4 m high palisade security fencing with a 1.6 m electrified anti-climbing extension security fence around the perimeter of the platform;
- Post construction mitigation measures including peatland restoration and landscape mitigation planting;
- Biodiversity enhancement works including native species planting and habitat creation; and
- Erection of a deer fence around the perimeter of landscape planting and peatland restoration areas.

2.3 Construction Programme

Subject to planning permission and other required consents and approvals being granted the indicative construction programme for the Proposed Development is as follows:

- Tree felling and vegetation clearance: September 2025;
- Construction start: January 2026; and
- Operation: January 2029.

The detailed construction phasing and programme are subject to change as the design progresses and necessary consents and wayleaves are agreed.

2.3.1 General Environmental Management Plans - GEMPs

General Environmental Management Plans (GEMPs) have been developed by the Applicant and cover a large range of activities. The GEMPs considered relevant to this project are provided in **Volume 4 Appendix 2.1** and all construction work will be undertaken in accordance with these. Relevant GEMPs are referenced, as appropriate, in the pertinent technical chapters.

2.3.2 Species Protection Plans - SPPs

Species Protection Plans (SPPs) have been developed by the Applicant and have been agreed with Nature Scot. These are also provided in **Volume 4 Appendix 2.1** and will be implemented during construction of the Proposed Development.

2.3.3 Construction Environment Management Plan - CEMP

A Construction Environment Management Plan (CEMP) will be developed for the Proposed Development by the Principal Contractor in consultation with the Applicant, and key consultees (as required). The principal objective of this document will be to provide information on the proposed infrastructure and to aid in avoiding, minimising and controlling adverse environmental impacts associated with the Proposed Development. Furthermore, this document will aim to define good practice as well as specific actions required to implement mitigation identified in the EIA, the planning process and / or other licencing or consenting processes. Mitigation measures relevant to the Proposed Development will be incorporated into the overall CEMP for the Proposed Development. The CEMP will be prepared during the pre-construction phase and form part of the contractual requirements between the Applicant and the Principal Contractor. The CEMP will form part of the proposed Planning Conditions put forward by the Applicant to THC. A draft CEMP has been included in **Volume 4 Appendix 2.2**.

2.4 Construction Practices and Phasing

2.4.1 Phase 1 - Forestry Clearance

Construction would require the removal of sections of commercial forest which would be undertaken in consultation with Scottish Forestry and the affected landowner. Any timber that is commercially viable would be transported off site to local timber markets and the remaining forest material would be dealt with in a way that delivers the best practicable environmental outcome and is compliant with waste regulations.

2.4.2 Phase 2 - Enabling works

Road improvements and Access

Detailed access proposals are being developed by the Principal Contractor.

The traffic route to the Proposed Development will be via the A9 / A949 through Bonar Bridge and then approximately 8 km along Lochbuie Road (U3521 public road), past Migdale before reaching the Site.

Based on desk study analysis and preliminary walkover inspections, access to the Proposed Development will be established through a new bellmouths and access roads from the public highway, located to the south, west and north of the proposed Carnaig Substation.

Assessments are currently being undertaken of the access route to determine if further works are required including bridge and culvert assessment, a review of existing street furniture and roadside vegetation.

A Construction Traffic Management Plan (CTMP) will be submitted for approval to THC to describe how the additional traffic generated due to the proposed construction works will be managed, with safety and improvement measures implemented so that the impact to the local area and persons will be minimised, as far as is reasonably practicable. A draft CTMP has been included in **Volume 4 Appendix 12.1**.

Temporary Site Compound

It is currently anticipated that a single main construction compound will be required, the location of which will be located within the red line boundary approximately 50 m south west of the proposed Carnaig Substation, adjacent to the proposed Carnaig Substation site access road (south) and just off Lochbuie Road (**Volume 3a Figure 2.1**).

2.4.3 Phase 3 – Construction works

This phase would comprise:

- Installation of temporary construction drainage;
- Creation of a level platform through cut and fill earthworks;
- Relocation of excavated peat in line with the peat slide risk assessment (**Volume 4 Appendix 10.1**) and outline peat management plan (**Volume 4 Appendix 10.2**);
- Installation of the control building and other infrastructure foundations;
- Installation of permanent site drainage (including retention basin);
- Erection of a control building;
- Erection of four buildings housing synchronous condensers;
- Installation of electrical plant (including air insulated switchgear, 400 kV substation complete with 400 kV double busbar arrangement and super grid transformers); and
- Installation of new 2.4 m palisade security fencing with a 1.6 m electrified anti-climbing extension and new gates

2.4.4 Phase 4 - Commissioning

The Proposed Development would 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 safe to energise. The Proposed Development would also go through a commissioning procedure for the switchgear, communications, and protection controls through the substation. The circuits would then be energised so the Proposed Development can be connected to the National Grid.

2.4.5 Phase 5 - Reinstatement

Following commissioning of the Proposed Development, all construction sites will be reinstated. Reinstatement will form part of the contract obligations for the Principal Contractor and will include the removal of all temporary access tracks and compounds, all work sites and replanting in accordance with a Landscape and Ecological Mitigation Plan that will be submitted for approval as part of the application for planning permission. Restoration of areas of peatland using peat excavated from the Proposed Development will be completed at this stage in line with the approved peat management plan.

Reinstatement works will be undertaken in line with good practice, which is reflected in SSEN Transmission GEMPs (**Volume 4 Appendix 2.1**).

Reinstatement of Access Tracks

Reinstatement would involve replacement of topsoil, grading and installation of drainage. Graded areas shall be planted in line with the Landscape and Ecological Mitigation Plan or would be allowed to vegetate naturally.

Reinstatement of Construction Compound

The construction compound will be reinstated at the end of construction with all buildings and materials removed and soils reinstated. The location will be revegetated in line with the Landscape and Ecological Mitigation Plan.

2.5 Construction Employment and Hours of Work

The Applicant takes community responsibilities seriously. The delivery of a major programme of capital investment provides the opportunity to maximise support of local communities through local employment opportunities and economic benefits.

Construction working is likely to be during daytime periods only. Working hours are currently anticipated between approximately 07.00 to 19.00 and are proposed for seven days a week. Any out of hours working will be agreed in advance with THC.

2.6 Construction Traffic

The construction phase will give rise to regular numbers of staff transport movements, with work crews travelling to the work site. There will be a single temporary compound area, with a safe area for parking away from the public highway, as detailed in **Section 2.4**.

Vehicle movements will be required to construct new or upgraded access roads; deliver the foundation materials to site; deliver and collect materials and construction plant from the main site compound (**Section 2.4**).

2.7 Operation and Management

2.7.1 Life of the Proposed Development

The Applicant is seeking planning permission for the Proposed Development in perpetuity. It is anticipated that the substation plant has a design life of approximately 40 years, after which it will be replaced with new equipment designed and installed to the relevant engineering specifications and environmental standards.

2.7.2 Maintenance Programme

Once operational, it is likely that monthly site visits would be made to the Proposed Development by maintenance personnel to undertake routine checks and operational switching. More specialist works, such as maintenance repairs or environmental management, will be required sporadically.

2.8 Residues and Emissions

Table 2.1 provides a summary of the anticipated residues and emissions for the purpose of Schedule 4, para. 1(d) of the EIA Regulations.

Table 2.1 Residues and Emissions

Topic	Potential residue / emission
Water	Construction: Surface water runoff and discharge is likely during construction. Pollution sources may arise as a result of soil erosion or from oil / fuel or chemical storage and use. Applicable GEMPs, including but not limited to, working in or near water, watercourse crossings, oil storage and refuelling and soil management will be implemented. 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, 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. Construction dust will be mitigated as part of the CEMP. Applicable GEMPs, including but not limited to, dust management will be implemented. 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. Peat removed from the footprint of the Proposed Development will be removed from the area and used to restore local areas of peatland in

Topic	Potential residue / emission
	line with the approved peat management plan. Applicable GEMPs, including but not limited to, soil management and working in sensitive habitats will be implemented. 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 as oil filled plant such as the super grid transformers will be located within suitable bunds which will undergo inspection and maintenance as required.
Noise and Vibration	Construction: Possible effects associated with construction and operation of the Proposed Development include: • noise during the construction phase; and, • noise due to construction traffic. Operation: Due to the nature of the Proposed Development no significant noise emissions are anticipated to be produced during operation apart from the super grid transformers. This will be assessed as part of the EIA and suitable mitigation will be designed where required.
Light	Construction: The temporary construction compound is 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: The site will be unmanned and as such no light sources have been identified during normal operation of the Proposed Development.
Heat, Radiation and Electromagnetic Fields (EMF)	Construction: No heat or radiation sources have been identified during the construction phase. There will be no significant EMFs generated during construction. Operation: No significant sources of heat, radiation or EMFs will be generated during operation of the Proposed Development. The issue of EMFs was scoped out of the assessment within the Scoping Report issued to THC.
Waste	Construction: The construction stage will require felling of woodland and vegetation removal. As such, it is anticipated that forestry related residues (brash) would result from the felling operations. Other wastes including (but not limited to) wood, metal and concrete from construction of the Proposed Development will be recycled or re-used where possible. All waste management relevant to the construction phase will be detailed within the CEMP. Where waste will need to be disposed of it will be done at the time it arises and in line with current legislation and best practice. Applicable GEMPs, including but not limited to, waste management, working with concrete and forestry will be implemented. Operation: Limited waste may arise from operation and maintenance due to the replacement of faulty / damaged equipment. All waste will be disposed of at the time it arises and in line with current legislation and best practice.

2.9 Decommissioning

The Applicant is seeking planning permission for the Proposed Development in perpetuity. As such, no separate assessment of decommissioning will be presented in the EIA report as it is a permanent facility.