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Figures and Visualisations (Volume 3a and 3b of this EIA Report)

There are no figures or visualisations associated with this chapter.

Appendices (Volume 4 of this EIA Report)

Appendix 3.1 - GEMPs

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction

This chapter describes the elements required for the construction and operation of the Proposed Development. It provides a description of the key components and information regarding the construction and operation of the Proposed Development.

The Proposed Development described within this Chapter and assessed within the technical chapters of this EIAR comprises the following elements outlined within **Section 3.3** and as depicted on **Volume 3 Figure 1.1**. This does not include any future cable connections into the Proposed Development site. Future cable connections are treated as either part of the future baseline, or accounted for in the assessment of cumulative effects, or a combination of the two, as appropriate to their individual completion timescales and the environmental topic in question.

In the case of the cable connection from the existing Spittal Substation to the southwest of the Proposed Development, this connection will be constructed within the same timescale but under Permitted Development (PD) rights, and as such is treated as a development within a proximity where cumulative effects could arise and are assessed as such.

3.2 Location of the Proposed Development

The Proposed Development is located in Caithness on agricultural land approximately 460 m northeast of the existing Spittal Substation, and approximately 2.4 km southeast of the nearest settlement of Halkirk at closest approach. Currently the majority of the site of the Proposed Development (the "Site") comprises rough grassland used for cattle/ sheep grazing, of Land Capability for Agriculture (LCA) grade 4.2 (Land capable of producing a narrow range of crops, primarily on grassland with short arable breaks of forage crops)[1], with a small (approximately 6 ha) area of coniferous woodland present along the western edge bordering the A9 highway. The position of the Site relative to various environmental constraints is shown on **Volume 3 Figure 1.1**.

3.3 Proposed Development Components

The Proposed Development includes the following works:

- Creation of a platform and the construction of a new outdoor Air Insulated Switchgear (AIS), 400 kV substation complete with 400 kV double busbar arrangement;
- Creation of a platform and construction of a new 525 kV DC 2GW Bi-pole HVDC converter station;
- Installation of two new Super Grid Transformers (SGT) within noise enclosures;
- Installation of two Synchronous Compensators (SYNCOMs);
- A new substation control building and two SYNCOM buildings;
- Security fencing around the substation and converter station;
- Sustainable Drainage Systems (SuDS), foul water drainage and detention basins for drainage control;
- Realignment of the Achalone Tributary around the southern and eastern edges of the Site, with naturalisation measures included to improve the realigned watercourse above its current condition;
- Internal roads for access and maintenance;
- Access points at approximate grid references ND 15580 56484 (planned to be the principal Site access), and ND 15676 56250 (planned to be a temporary site access);
- Mounding for the purposes of visual screening;
- Planting for the purposes of visual screening, landscape improvement and Biodiversity Net Gain (BNG);
- Cut and fill earthworks as required to enable the above; and

[1] Scotland's Soils, National scale land capability for agriculture, 2024, accessed at: National scale land capability for agriculture | Scotland's soils (environment.gov.scot)

- Temporary construction compounds and material storage areas for the duration of the construction phase.

The substation and converter station equipment would be housed both outdoors and indoors, with buildings likely to comprise a steel portal frame with metal cladding and roof. These would be designed to reduce visual and noise impact. The colour of the buildings is anticipated to be green.

The planning application identifies the following elements of design for the Proposed Development.

3.3.1 400 kV Substation

A 400 kV substation is required to facilitate windfarm connections in the area at 400 kV. The new 400 kV AC substation will have a double busbar arrangement complete with two main busbar section bays, two reserve busbar circuit breaker bays, three bus couplers, two 400/275 kV Super Grid Transformers circuit breaker bays, two HVDC circuit breaker bays, six-line feeder circuit breaker bays, and two synchronous compensators circuit breaker bays and two 275 kV Super Grid Transformer circuit breaker bays. The substation platform has an area of 167,400 m^2(8.62 ha), 540 m long by 310 m wide. There are three buildings namely the central control building (optional) and two synchronous compensator buildings. The area of buildings on the substation platform is 937.7 m^2 and 2 x 983.6 m^2, respectively.

3.3.2 Spittal to Peterhead HVDC Converter Station

A HVDC converter station is required to enable a proposed 2 GW 525 kV HVDC link to Netherton Hub in Aberdeenshire. This would enable the efficient high volume power transmission from generators in the North of Scotland to the proposed network at Netherton Hub for further transmission to demand centres as appropriate. The DC station would be composed of a series of buildings enclosing apparatus and providing welfare and spares storage. The converter station platform has an area of 86,100 m^2, there are two main converter buildings, one for each pole of dimensions 123 m long by 63 m wide by 26.4 m in height. There are a number of other buildings within the DC platform including an Operator Building, Interface Transformer Building, Service Building, Spares building and other smaller ancillary buildings. The total area of buildings on the DC platform is 26,200 m^2.

3.3.3 Drainage

A surface and foul water drainage strategy (see **Volume 4 Appendix 12.2**) has been prepared for the Proposed Development, which includes drainage and Sustainable Drainage System (SuDS). SuDS mimic natural drainage processes to reduce the effect on the quality and quantity of runoff from developments and provide benefit to amenity and biodiversity. The SuDS have been integrated within the landscape proposals to enhance amenity, biodiversity, and habitat, whilst protecting and/or enhancing water quality.

Two waterbodies have been identified within the Site and surrounding area, Halkirk Burn and the Achalone Tributary. No public foul, surface or combined water sewers have been identified within the Site.

It is proposed to capture and attenuate the runoff from the hardstanding surfaces, including roads, buildings, transformer bunds and concrete refuelling areas and let the water permeate through the remaining surfaces, including the free draining fill making up the substation platform. Detention basins are proposed to attenuate and provide treatment to the runoff from the hardstanding surfaces within the platforms, which is to be discharged into the existing watercourses. As the proposed platform areas are currently divided in four catchments, the discharge will be limited to the greenfield runoff rate from only the catchment feeding into the chosen watercourses.

The remaining platform area is to be constructed from granular fill as per SSEN specification. The granular fill is to allow water to permeate through and runoff/infiltrate the formation layer, which will be graded towards the existing catchments to mimic existing runoff regimes.

3.3.4 Lighting

Floodlights would be installed but would only be used in the event of a fault during the hours of darkness; during the over-run of planned works; or when sensor activated as security lighting for nighttime access. The access

roads would not be lit under normal operation. A light would also be provided permanently at access gates and would be sensor activated.

3.3.5 Security fencing

A 4 m high security fence would be installed around platforms. Existing stone walling around the perimeter of the site along the A9 trunk road will remain in place, and landscape mounding will sit behind this wall. A new access point will be provided along the A9, where that section of wall will be removed. There will be a field gate access for security.

3.4 Design and Access

The design of the Proposed Development has been driven by a combination of technical requirements and adopted design principles to ensure the Proposed Development is sensitively sited and designed (**Chapter 4 Site Selection and Alternatives**). Mitigation, in the form of landscape planting and mounding has been included in the final design (see **Volume 3 Figure 8.5: Landscape Plan**) to provide habitat biodiversity and minimise potential landscape and visual impacts where possible.

A single new permanent access would be created from the A9, west of the Site. The on-site access track layout has been designed to connect the various Proposed Development elements, whilst minimising hardstanding and maximising available land for landscape landform and planting. This new access point will also be the access point during the construction phase of the Proposed Development. A secondary site access track would also be utilised during construction of the HVDC and OHL platform. This is approximately 200 m south of the permanent access and would be reinstated once operational.

Further details are provided in the Design and Access Statement, a document accompanying the planning application, which accompanies the planning application for the Proposed Development.

3.5 Earthworks

The proposed earthworks will extend over most of the Site. In general, unnecessary earthworks have been avoided so there is some land that will remain unworked mainly towards the northern boundary. Ground within the Site would be changed in level, to flatten it for proposed building platforms and graded for road profile or sloped between infrastructure interfaces.

All hardcore and earthworks materials for the construction of the Proposed Development is anticipated to be won on site through cutting of the existing surface to construct the platforms. This would generally comprise of cut required for the creation of the building platforms, mostly found at the HVDC Converter Station Platform and fill, the majority of which would be required for the construction of AC platform and landscape bunds. Earthworks would also be required to construct the detention basins with the cut material used for landscaping. Surplus topsoil following the earthworks, would be used as part of the landscaping strategy. The Site has been designed to have a cut fill balance, to minimise the amount of imported and exported material required and in turn minimise the construction traffic.

3.6 Typical Construction Activities

Key tasks during construction of the Proposed Development are:

- enabling works, site clearance and demolitions;
- platform earthworks and creation of level platforms;
- bund/screening earthworks;
- construction of site drainage, including SuDS, diversion and naturalisation of Achalone Tributary;
- construction and installation of the buildings;
- installation of electrical plant;
- erection of a security fence up to approximately 4 m in height around platforms;
- commissioning; and

- reinstatement and planting.

3.6.1 Enabling Works

The enabling works will include (but not be limited to) existing utilities diversions, installation of new temporary and permanent water supplies, installation of temporary access track which will be reinstated following construction, electrical and telecommunication services and, diversion of the Achalone Tributary and establishment of a temporary construction compound including welfare facilities.

3.6.2 Site Clearance and Demolition

No demolition is required to facilitate the construction of the Proposed Development.

Where required, vegetation would be carefully removed from within the Site, including trees and hedgerows subject to any ecological considerations relating to timing and method of working. For the purposes of the EIA an assumption has been made that the entire site will be cleared of vegetation to assume a reasonable worst-case scenario. Practically, the contractor will look for opportunities to maintain existing vegetation.

3.6.3 Associated Works

Other associated works are required to facilitate construction of the Proposed Development or would occur as a consequence of its construction and operation. The associated works are offsite BNG compensatory habitat creation/ enhancement and two different options have been identified close to the site. These works do not form part of the description of the Proposed Development and are therefore not included in the application for detailed planning permission. On that basis they are therefore not assessed in detail in this EIAR. However, further detail on some of these elements is provided where available, as noted within the relevant appendices to this Chapter.

3.7 Construction Programme

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

- Site access: September 2025;
- Construction: September 2025-September 2028;
- Construction completion: September 2028; and
- Fully Operational: 2030.

For the purposes of the EIA, the key dates are assumed to be:

- Works on Site commencing 1st September 2025;
- Construction works on Site completed 1st September 2028; and
- Operational phase (in perpetuity) commencing 1st September 2028.

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

3.8 Environmental Management during Construction

The assessment in this EIA Report has been carried out on the basis that all works would be carried out in accordance with industry best practice construction measures, guidance and legislation, all as detailed within the following documents and procedures.

3.8.1 General Environmental Management Plans

General Environmental Management Plans (GEMPs) have been developed by the Applicant. The GEMPs considered relevant to this project are provided in **Volume 4 Appendix 3.1** and all construction work will be undertaken in accordance with these.

3.8.2 Species Protection Plans

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

3.8.3 Construction Environmental 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 would also reference the aforementioned GEMPs and SPPs. The implementation of the CEMP would be managed on site by a suitably qualified and experienced Environmental Clerk of Works (ECoW), with support from other environmental professionals as required. The Applicant would carry out regular inspections and audits to monitor the implementation of the CEMP.

Relevant Authorisation would be required and obtained from SEPA in accordance with the Controlled Activity Regulations (CAR) prior to any construction works commencing on site. This would specify the controls and measures that would be used at site to safeguard the water environment.

3.9 Mitigation Proposals

A series of mitigation measures have been identified to reduce the potential environmental effects of the Proposed Development.

3.10 Landscape Mitigation Measures and Biodiversity Enhancement

Landscape mitigation measures have been proposed for the Proposed Development to mitigate potential adverse effects on local landscape character and visual amenity. The objective for landscape mitigation is to use landform and planting to minimise potential impacts, by responding to the local rural landscape character, the natural contours and vegetation pattern. Mounding will be located along the boundary with the A9 as well as within the site to provide early screening before the planting has sufficiently matured and can reinforce that early screening. The planting will be designed to avoid providing a solid block of planting alongside the A9 and to prevent an overbearing appearance where opposite residential receptors.

The proposed planting and reinstatement works would be designed to create a variety of natural habitats, characteristic of this part of Caithness with the intention to improve the biodiversity of the Site. Local types of habitat were identified with an emphasis on delivering target habitats through the creation of grassland, woodland and forest, wetland and riverine habitat.

Further details on the landscape mitigation strategy are provided **Chapter 8 - Landscape and Visual Impact**, and a plan showing landscaping measures is included in **Volume 3**.

Visualisations of the Proposed Development have been produced from seven locations within the vicinity of the Site and are included in **Volume 4 Appendix 8.1**. The visualisations provide post mitigation photomontages and wirelines, illustrating the Proposed Development at Year 1 and at Year 12 when operational, with the establishment of the proposed planting.

In addition, the Applicant will develop a long-term Landscape and Ecology Management Plan to ensure measures are in place for the long-term maintenance of the proposed planting, habitat and biodiversity enhancement measures.

3.11 Biodiversity Net Gain

Biodiversity Net Gain (BNG) is a process which leaves nature in a better state than it started. SSEN Transmission has developed a BNG toolkit based upon the SSEN Transmission Toolkit, which aims to quantify biodiversity based upon the value of habitats for nature. It is an efficient and effective method for demonstrating whether development projects have been able to maintain or increase the biodiversity value of a development site after construction works.

For BNG to be used appropriately and to generate long-term gains for nature, the good practice principles established by the Business and Biodiversity Offset Programme (BBOP)16 have been followed. These principles have been established in the context of UK development by the CIRIA, the Chartered Institute for Ecology and Environmental Management (CIEEM) and the Institute of Environmental Management and Assessment (IEMA).

SSEN Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from their construction and operational activities. As part of this approach, SSEN Transmission has made commitments to deliver a minimum 10 % Biodiversity Net Gain on all new projects gaining consent from May 2023[2], in addition to their previous Sustainability Strategy (2018)[3] , Sustainability Plan (2019)[4] and RIIO-T2 Business Plan[5], for new infrastructure projects to:

- ensure natural environment considerations are included in decision making at each stage of a project's development;
- utilise the mitigation hierarchy to avoid impacts by consideration of biodiversity in project design;
- deliver a minimum 10 % biodiversity net gain on all projects gaining consent from May 2023 onwards; and
- work with their supply chain to gain the maximum benefit during asset replacement and upgrades.

The construction and operation of the Proposed Development will be carried out in line with these commitments.

3.12 Construction Practices and Phasing

3.12.1 Phase 1 - Enabling works

Road improvements and Access

Detailed access proposals will be developed by the Principal Contractor (once appointed). In general, based on desk study analysis and preliminary walkover inspections, access will be established through a combination of:

- Installation of bellmouth junction on the A9 for access to the Site;
- Installation of new bound access road with the Site;
- Installation of temporary new stone tracks; and
- Installation of permanent new stone tracks.

Watercourse Diversion

The diversion of the Achalone tributary will implement a natural channel to replace the current linear routing of the watercourse. The design will incorporate measures which enhance the in-channel and riparian habitat quality through the provision of a multistage channel and marginal planting using a natural routing.

[2] SSEN Transmission, (2023). Delivering a positive environmental legacy - SSEN Transmission. [Online] Available at https://www.ssen-transmission.co.uk/globalassets/projects/kintore---tealing-400kv-ohl-downloads/new-delivering-a-positive-environmental-legacy-booklet---no-bleed.pdf.

[3] Delivering a smart, sustainable energy future: The Scottish Hydro Electric Transmission Sustainability Strategy (2018). [Online] Available at https://www.ssen-transmission.co.uk/media/2701/sustainability-strategy.pdf [Accessed: February 2024].

[4] Our Sustainability Plan: Turning Ambition into Action. (2019) SHE Transmission. [Online] Available at [https://www.ssen-transmission.co.uk/media/3215/our-sustainability-plan- consultation-report.pdf] [Accessed: February 2024].

[5] A Network for Net Zero - SSEN Transmission (ssen-transmission.co.uk)

Temporary Site Compounds

One construction compound will be required, located in the southern corner of the Site for welfare, parking, and laydown for platform construction. The exact size of the compound may be subject to change and will be confirmed by the Principal Contractor. Plant and materials storage areas will also be confirmed by the Principal Contractor.

Forestry Clearance

Construction would require the removal of approximately 4.8 ha of coniferous trees which are believed to be non-commercial. This would be undertaken in consultation with Scottish Forestry and the affected landowner. It is assumed at this stage that all trees on site would be removed to facilitate construction, although opportunities to minimise loss of trees will be sought where possible as the design develops.

Opportunities for reforestation or compensatory planting will be explored in consultation with Scottish Forestry and other relevant stakeholders to offset the loss and support ecosystem restoration. This approach aligns with national forestry policies and sustainability goals.

3.12.2 Phase 2 – Construction works

This phase would comprise:

- Creation of a level platform;
- Installation of security fencing;
- Laying of foundations, including construction of site drainage;
- Erection of control buildings;
- Installation of electrical plant; and
- Construction of SuDS and planting of screening/ BNG vegetation.

3.12.3 Phase 3 - 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 fit to energise. The Proposed Development would also go through a commissioning procedure for the switchgear, communications, and protection controls through the substation and converter station. The circuits would then be energised so the Proposed Development can be connected to the National Grid.

3.12.4 Phase 4 - 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, all work sites and the re-vegetation of the construction compound etc.

The following principles will inform the approach to reinstatement of all sites:

- Best practice will be followed for reinstatement of all sites; and
- Reinstatement principles are detailed in the GEMPs (**Volume 4 Appendix 3.1**).

Reinstatement of Access Tracks

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

Reinstatement of Construction Compound

The construction compound site will be made good at the end of construction with all buildings and materials removed and soils appropriately reinstated.

3.13 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.

Employment of construction staff will be the responsibility of the Principal Contractor but the Applicant will encourage the Principal Contractor to make use of suitable labour and resources from areas local to the location of the works.

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

Working hours are currently anticipated between approximately 07.00 to 19.00 during British Summer Time (BST) and 07.00 to 18.00 during Greenwich Mean Time (GMT), seven days a week.

3.14 Construction Traffic

The construction works will give rise to regular numbers of staff transport movements, with small work crews travelling to the Site. It is anticipated that the Principal Contractor will confirm the construction compound area, with a safe area for parking away from the public highway.

Vehicle movements to the Site from the local highway network will be required to bring construction plant to the Site and deliver the foundations, buildings, materials and other infrastructure components to site.

Table 3.1 provides an indicative summary of the total anticipated traffic movements associated with construction of the Proposed Development, broken down by Phases.

Table 3.1: Anticipated Construction Traffic Movements

AIL	Low loader	Tipper	Flat Bed	Staff	Van	Concrete	Medium Wagons
12	392	4,780	3,114	56,320	137,060	2,840	21,690

3.15 Operation and Management of the Substation and Converter Station

3.15.1 Life of the Proposed Development

It is anticipated that the Proposed Development will be operational for at least 40 years and consent is being sought in perpetuity.

3.15.2 Maintenance Programme

It is expected that the Proposed Development would require approximately 10 permanent staff onsite during operation. 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.

At detailed design, a comprehensive Landscape and Ecology Management Plan would be formulated working alongside the SSEN Estates Team to ensure the delivery of a range of natural habitats are achievable in the short term and long-term meeting the objectives of the environmental mitigation in relation to landscape character, visual amenity, BNG and protected species considerations.

A full SuDS maintenance plan would be produced as part of the detailed drainage design. The maintenance of the drainage network will be the responsibility of SSEN Transmission.

3.15.3 Residues and Emissions

Due to the nature of the Proposed Development, no significant production of residues or emissions are anticipated during the operational phase beyond small amounts of waste e.g. packaging materials and the potential for small spillages of fuel and oils during routine maintenance and repair of the electrical infrastructure and housing. Some operational noise is anticipated from the HVDC converter station and substation, which is assessed in **Chapter 13 - Noise and Vibration**.

During construction, residues and emissions are anticipated to be consist primarily of construction noise, and any potential fuels/ oils/ waste generated during construction works. These are assessed in **Chapter 12 - Hydrology, Hydrogeology, Geology and Soils** and **Chapter 13 - Noise and Vibration** respectively.

Some potential sources of residues and emissions such as operational phase noise and Heat, Radiation and Electromagnetic Fields (EMF) have been scoped out of this EIA. More information is provided in **Chapter 6 Section 6.6 - Issues scoped out of assessment.**

3.16 Decommissioning

The Applicant is seeking consent in-perpetuity for the Proposed Development. In the event of decommissioning, or replacement, it is anticipated that the level of effect would be similar but less than during construction. Decommissioning would be undertaken in line with the best practice processes and methods at that time and managed through a Decommissioning Environmental Management Plan agreed with the relevant authority. No separate assessment of decommissioning is presented in this EIAR.