Scottish & Southern Electricity Networks

TRANSMISSION

Sloy Substation Site Selection

Consultation Report

August 2021

REF: LT258

Scottish & Southern Electricity Networks

TRANSMISSION

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GLOSSARY

Term	Definition
Amenity	The natural environment, cultural heritage, landscape and visual quality. Also includes the impact of SSEN Transmission plc's works on communities, such as the effects of noise and disturbance from construction activities.
Area of Search	A broad geographical area within which possible sites might be capable of identification within approximately 5 km of the required connectivity point.
Biodiversity Net Gain (BNG)	Biodiversity Net Gain (BNG) is a process which leaves nature in a better state than it started.
Birds of Conservation Concern (BoCC)	The population status of birds regularly found in the UK, Channel Islands and the Isle of Man is reviewed every five years to provide an up-to-date assessment of conservation priorities.
Conductor	A metallic wire strung from structure to structure, to carry electric current.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views and, normally, with the objective of influencing decisions, policies or programmes of action.
Environmental Impact Assessment (EIA)	Environmental Impact Assessment. A formal process codified by EU directive 2011/92/EU, and subsequently amended by Directive 2014/52/EU. The national regulations are set out in The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. The EIA process is set out in Regulation 4(1) of the regulations and includes the preparation of an EIA Report by the developer to systematically identify, predict, assess and report on the likely significant environmental impacts of a Proposed Development or development.
Grid Transformers (GT)	Transformer to supply an alternating voltage to a grid circuit or circuits. Transformers are used to change voltages and currents in transmission lines.
Groundwater Dependent Terrestrial Ecosystems (GWDTE)	Groundwater Dependent Terrestrial Ecosystems (GWDTE) are wetlands which critically depend on groundwater flows or chemistries.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities.
Herpetofauna	Reptiles and amphibians of a particular region, habitat, or geological period.
Kilovolt (kV)	One thousand volts.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A – C(s).
Micrositing	The process of positioning individual structures to avoid localised environmental or technical constraints.
Mitigation	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel towers or poles.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Riparian Woodland	Natural home for plants and animals occurring in a thin strip of land bordering a stream or river.
Routeing	The work undertaken which leads to the selection of a proposed alignment, capable of being taken forward into the consenting process under Section 37 of the Electricity Act 1989.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Semi-natural Woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition.

Term	Definition
Sites of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain.
Span	The section of overhead line between two structures.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 74/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981.
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission plc works.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 74/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981.
Study Area	The area within which the appraisal of the substation options takes place. • Detailed Study Area - An area extending approximately 1 km from the substation site options within which the study takes place. • Wider Study Area - An area extending approximately 5 km from the substation site options within which the study takes place.
Substation	A node on the network to allow safe control of the electricity network. This could include convergence of multiple circuits, transformation of voltage or other functions to maintain and operate the electricity network.
Substation Site Area	Site area identified as necessary to deliver all the substation infrastructure requirements e.g. platform, access tracks, temporary construction area, drainage including SUDS, landscaping.
Substation Platform Area	Area of the stone platform required for the HV infrastructure.
Terminal Structure	A structure (tower or pole) required where the line terminates either at a substation or at the beginning and end of an underground cable section.
The National Grid	The electricity transmission network in the Great Britain.
Volts	The international unit of electric potential and electromotive force.
Water Framework Directive (WFD)	The Water Framework Directive 2000/60/EC is an EU directive which commits European Union member states to achieve good qualitative and quantitative status of all water bodies (including marine waters up to one nautical mile from shore)

PREFACE

This Consultation Document has been prepared by WSP UK Ltd. on behalf of Scottish Hydro Electric Transmission PLC (SHE Transmission) to seek comments from all interested parties on the Sloy Power Station Transformer Replacement scheme.

The Consultation Document is available online at the project website:

https://www.ssen-transmission.co.uk/projects/sloy-power-station-transformer-replacement-project

Under normal circumstances, consultation on the project would involve public engagement events held in the local area. However, as a result of the COVID-19 pandemic this has not been possible.

To continue engagement on the project SHE Transmission have developed an online consultation tool, to enable the local community to experience the full exhibition on a computer, tablet or mobile device. The online exhibition has been designed to look and feel like a real consultation in a community hall, with exhibition boards, maps, interactive videos and the opportunity to share views on the proposals.

Visitors were able to engage directly with the project team, via a live chat function, where they could ask any questions they might have about the project and share their feedback on the current proposals.

The virtual consultation events were held via the project website at the following times:

- Tuesday 24th August 2021
  - 12.00 – 13.30
  - 17.00 – 19.00

Comments on this Consultation Document should be sent to:

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10 Henderson Road,

Inverness, IV1 1SN

Email: sally.cooper@sse.com

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All comments are requested by **Tuesday 28th September 2021**.

EXECUTIVE SUMMARY

The four existing transformers at Sloy Power Station, which convert the 11 kV output of the hydro-electric power station to 132 kV for export to the Transmission network, are coming to the end of their operational life and need replacing. The consequent deterioration in their condition poses a risk of failure, meaning the power station would no longer be able to generate renewable energy and poses risks to the reliability of supply to customers.

The existing transformers were installed when engineering design standards were very different. Modern transformers are quieter and more efficient but also require more space around them for cooling and safe access for maintenance teams. This, together with a need to keep the power station connected to the network, means that a new substation site outwith the existing power station compound has to be found.

Sloy power station generates around 150 megawatts of renewable power, contributing to Scotland's targets for reducing carbon emissions.

The Proposed Development is in line with SHE Transmission's commitment and licence obligation to facilitate the connection of renewables generators to the grid through an economical, efficient and coordinated approach to transmission reinforcement.

Site options were identified which provided feasible areas for the substation to be developed, and from which a Preferred Substation Site Option can be identified that provides an optimum balance of environmental, technical and environmental factors. This Consultation Document invites comments from all interested parties on the Site Options assessment and Preferred Substation Site Option.

Moving forward, confirmation of the Preferred Substation Site Option will be informed by this consultation exercise together with feedback from the public events. Subject to the outcome of the consultation, the Preferred Substation Site Option will then be referred to as the Proposed Site and will be taken forward for detailed design. The outcome of the substation site selection process will be a development for which consent under the Town & Country Planning regime will be sought. Further public and stakeholder consultation will be undertaken to present the proposals ahead of submitting a planning application.

When providing comments and feedback on this Consultation Document, SHE Transmission would be grateful for your consideration of the questions below:

- Has the requirement for the project been clearly explained?
- Based on the information provided do you have a preferred and/or worst site location?
- Are there any additional factors, or environmental features that you consider important and should be brought to the attention of the project team?

1. INTRODUCTION

1.1 Purpose of Document

1.1.1 This Consultation Document invites comments from all interested parties on Sloy Power Station Transformer Replacement Project. The project is to replace and relocate four 132 / 11 kV grid transformers to the new Sloy substation, located next to Sloy Hydro Power Station, Inveruglas in Argyll and Bute.

1.1.2 This Consultation Document describes the substation site options identified, the site options appraisal undertaken and the identification of the preferred substation site. Comments are now sought from statutory authorities, key stakeholders, elected representatives and the public on the substation site selection process and the preferred substation site.

1.1.3 All comments received will inform further consultation of the preferred substation site.

Figure 1: Site Location

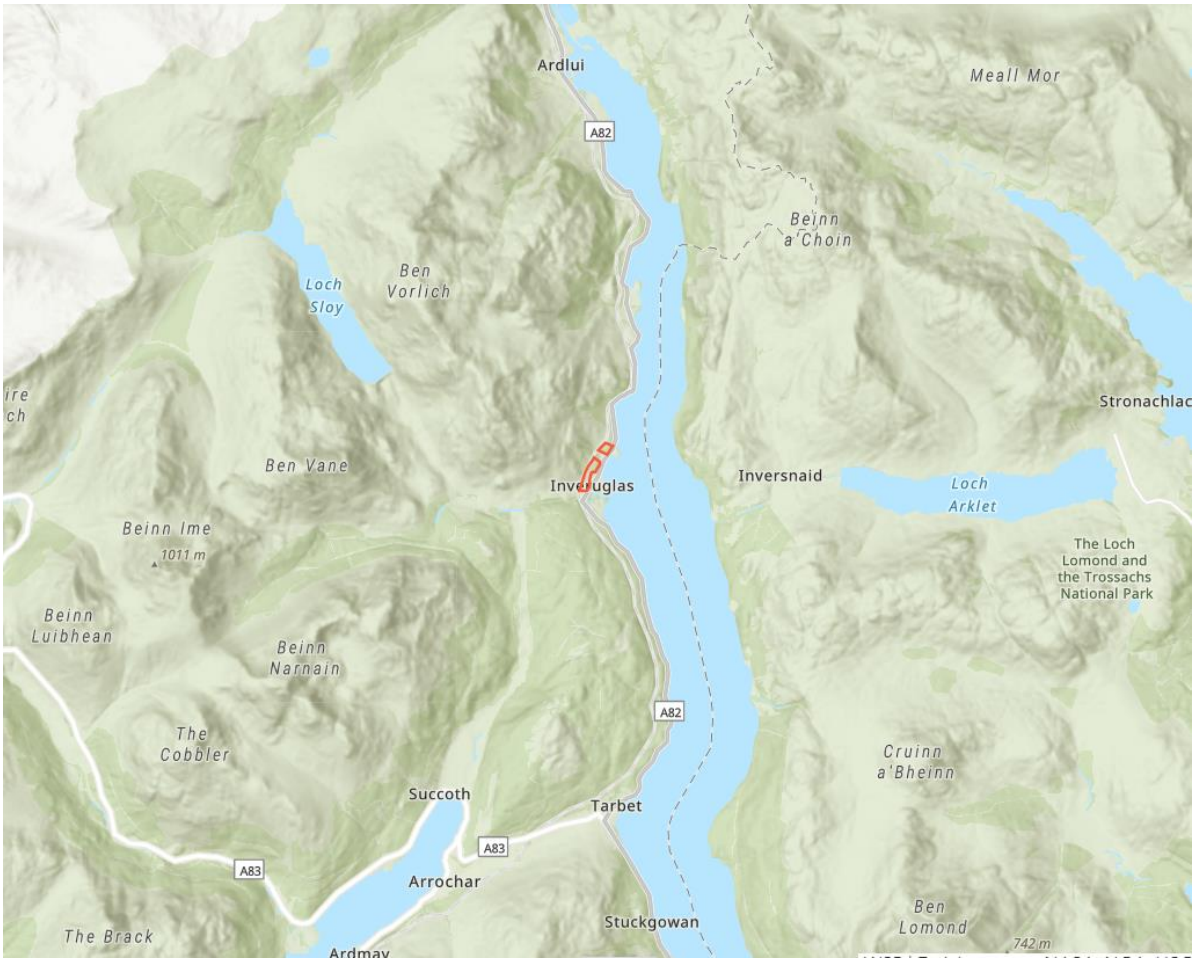

Figure 2: Site Options Plan

1.2 Document Structure

1.2.1 This report is comprised of six sections as follows:

1: Introduction – setting out the purpose of the Consultation Document;

2: The Proposals – describes the need for the proposals and provides an overview of the proposals;

3: Site Selection Process – sets out the process that has been applied in the selection and appraisal of site options;

4: Description of Sites – describes the site options that have been identified, the baseline environmental and engineering conditions and provides a comparative appraisal of the substation options;

5: Consultation on the Proposals – invites comments on the site selection process and identification of the preferred site; and

6: Consultation on the Proposals – outlines the next steps following the consultation events.

1.3 Next Steps

1.3.1 As part of the consultation exercise, comments are sought from members of the public, statutory consultees and other key stakeholders on the recommended preferred substation site. A Report on Consultation will be produced which will document the consultation responses received, and the decision made in light of these responses.

1.3.2 Following the identification of the Proposed Substation Site, further survey work and technical assessments will be undertaken to support the detailed selection process with the objective of identifying a proposed site which can be taken forward into the consenting, and if required, Environmental Impact Assessment (EIA) processes.

2. THE PROPOSALS

2.1 The Need for the Project

2.1.1 SSEN Transmission is a wholly owned subsidiary of the SSE plc group of companies. SSEN Transmission owns and maintains the electricity transmission network across the north of Scotland, and operating as Scottish Hydro Electric Transmission plc, holds a license under the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical system of electricity transmission.

2.1.2 The four existing transformers at Sloy Power Station, which transform the 11 kV output of the hydro-electric power station to 132 kV for export to the Transmission network and provide a connection to the distribution network, are coming to the end of their operational life and need replacing. The consequent deterioration in their condition poses a risk of failure, meaning the power station would no longer be able to export renewable energy and poses risks to the reliability of supply to customers.

2.1.3 The existing transformers were installed when engineering design standards were very different. Modern transformers are quieter and more efficient but also require more space around them for cooling and safe access for maintenance teams. This, together with a need to keep the power station connected to the network, means that a new substation site outwith the existing power station compound is required.

2.1.4 Sloy power station generates around 150 megawatts of renewable power, contributing to Scotland's targets for reducing carbon emissions.

2.2 Alternative Options Considered

2.2.1 Alternative options considered include the following:

Do nothing

2.2.2 The Do-Nothing option undertakes no refurbishment work on the transformers. This option has been discounted at this stage as the Asset Condition Report and work undertaken by Polaris do not support a do-nothing option and have demonstrated a clear and unambiguous need to undertake intervention works on the Sloy transformers in the RIIO T2[1] period to prevent the temporary or permanent loss of these transformers. Without intervention the internal condition of these units is expected to further deteriorate and there is a risk of multiple transformer failure units at Sloy.

Do minimum

2.2.3 The do minimum option includes additional monitoring on the grid transformers (GT) rather than replacing these. However, this option does not extend the life of the GT to the RIIO T3 period (2029 – 2036). Therefore this option has not been taken forward.

Do Something

2.2.4 Table 2-1 summarises each of the do something scenarios stating if the option has not been taken forward for detailed analysis.

[1] Ofgem Network price controls 2021-2028 (RIIO-2) [Accessed: https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/network-price-controls-2021-2028-riio-2]

Table 2-1 – Option summary

Option	Option Detail	Taken forward for Detailed Analysis
Refurbishment Option 1	Undertake offsite refurbishment of the grid transformers. In situ replacement of GT3 and GT3 in RIIO T2 period and replace GT1 and GT2 in the RIIO T3 period.	No
Refurbishment Option 2	Undertake offsite refurbishment of the grid transformers. Offline build of GT3 and GT4 in RIIO T2 period and replace GT1 and GT2 in the RIIO T3 period.	Yes
Refurbishment Option 3	Undertake offsite refurbishment of the grid transformers. Offline build of GT1, GT2, GT3 and GT4 in RIIO T2 period.	Yes
Refurbishment Option 4	Undertake offsite refurbishment of the grid transformers. Offline build of GT1, GT2, GT3 and GT4 and an additional 11 kV busbar for additional generator security in RIIO T2 period.	No
Refurbishment Option 5	Undertake offsite refurbishment of the grid transformers. Offline build of GT3 in RIIO T2 period, and replace GT1, GT2 and GT4 in the RIIO T3 period.	Yes

2.2.5 A cost benefit analysis was undertaken which determined Refurbishment Option 3 as the preferred option. This option meets the requirement of the asset condition-based replacement that has to be undertaken in RIIO T2 and avoids the need for additional spending on temporary tower diversions that would be associated with Option 1 and Option 2.

2.3 Proposal Overview

2.3.1 The Proposed Development, known as the Sloy Power Station Transformer Replacement scheme, is proposing to replace and relocate four 132 / 11 kV grid transformers at the existing Sloy substation, located next to Sloy Hydro Power Station, near Loch Lomond Holiday Park, north of Tarbet. The Proposed Development involves the construction of a new substation compound in proximity to the power station. This will enable the four new transformers and associated switchgear to be built offline, whilst maintaining connection for the power station to the electricity network. The connections will then be swapped over from the current transformers to the new ones under an outage.

2.3.2 The following elements are included as a part of the Proposed Development:

- A new substation platform, indicatively 85 x 71 metres in size, surrounded by a 2.4 m high metal palisade security fence.
- The installation of four new 132 / 11 kV transformers, Air Insulated Switchgear (AIS) to connect them.
- A new control building.
- Connection to the existing 132 kV overhead lines which could be overhead via new towers and gantries in the substation, or possibly via underground cables (to be confirmed and dependent on which site is chosen).
- A number of 11 kV underground cables installed to connect the new transformers back to the power station.
- Existing access from the A82 to be used and may be subject to upgrade.
- Removal of the old transformers and associated equipment at the power station.
- Removal of any redundant overhead line apparatus.

Construction Activities

2.3.3 To facilitate the Proposed Development, the main construction elements associated with the development are anticipated to include:

- Establishment of temporary construction compound and any temporary access track construction including bell mouth improvements;
- Establishment of suitable laydown areas for materials;
- Ground works to achieve a level area at the site;
- Delivery of components and materials to site;
- Construction of the 132 / 11kV substation, 132 kV overhead line connection and 11 kV underground cables to connect the substation to the power station;
- Construction of a control building;
- Remedial works to reinstate the immediate vicinity, and any ground disturbed to pre-existing condition; and
- Inspections and commissioning.

Programme

2.3.4 It is anticipated that construction of the project would take at least 21 months, following the granting of consents, although detailed programming of the works would be the responsibility of the Contractor in agreement with SSEN Transmission plc.

Access Track Upgrade / Installation

2.3.5 No new access would be provided onto the A82, with the existing track being utilised. A new access track would likely be required, the length of which depends on the preferred site option. The access track would be taken off the existing access road, from one of the three existing bell mouths / connections to the A82. Temporary access tracks may be required for the construction of the Proposed Development.

2.4 Biodiversity Net Gain

2.4.1 Biodiversity Net Gain (BNG) is a process which leaves nature in a better state than it started. Although it is an internationally recognised process and tool within the development industry, it is not a term that is widely used or implemented in Scotland[2]. A small handful of businesses are making voluntary commitments to incorporating BNG into their projects, including SSEN Transmission plc.

2.4.2 SHE Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from its construction and operational activities on biodiversity. SHE Transmission 's published commitment for new infrastructure projects is 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.
- Positively contribute to the UN and Scottish Government Biodiversity strategies by achieving an overall 'No Net Loss' on new infrastructure projects gaining consent in 2020 onwards and achieving Net Gain on projects gaining consent in 2025 onwards.
- Work with our supply chain to gain the maximum benefit during asset replacement and upgrades.

2.4.3 SHE Transmission has developed a BNG toolkit for use across the business, their consultants and contractors, and enable a full assessment of the new BNG metric to ensure it meets the needs of SHE Transmission's

[2] CIEEM. 2019. Biodiversity Net Gain in Scotland. CIEEM Scotland Policy Group. https://cieem.net/wp-content/uploads/2019/06/Biodiversity-Net-Gain-in-Scotland-CIEEM-Scotland-Policy-Group.pdf

Scottish developments. 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.

2.4.4 BNG does not apply to statutory designated sites or irreplaceable habitats (e.g. blanket bog, ancient woodland)[3]. The project is required to attain a No Net Loss as a minimum.

3. SITE SELECTION PROCESS

3.1 Background

3.1.1 The approach to site selection was informed by SSEN Transmission's guidance on 'Substation Site Selection Procedures for Voltages at or above 132kV[4]' (November 2020). The guidance sets out the approach to identification and selection of new substation sites. This document helps SSEN Transmission to meet its obligations under Schedule 9 of the Electricity Act 1989, which requires transmission license holders:

- To have a regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interests; and
- to do what they reasonably can to mitigate any effect that the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.

3.1.2 The guidance aims to balance these environmental considerations with technical and economic considerations throughout the site selection process.

3.1.3 The guidance splits the principal site selection into stages, as follows:

- Stage 0: Pre-Site Selection Activities – Strategic Connections Options Appraisal
- Stage 1: Initial Site Screening
- Stage 2: Detailed Site Selection
- Post Site Selection Activities – Consenting Process

3.1.4 The stages that are carried out can vary depending on the type, nature and size of a project and consultation is carried out at each stage of the process as appropriate. This project is currently at Stage 1: Initial Site Screening, the objective of which is to identify technically feasible, economically viable and environmentally acceptable site options within a defined area.

3.1.5 In consideration of the principles outlined in the guidance document, the method of identifying a preferred substation site in this study has involved the following 4 key tasks:

- Identification of the baseline situation;
- Identification of substation site options;
- High level appraisal of substation site options; and
- Identification of a preferred substation site.

3.2 Area of Search

3.2.1 An Area of Search was identified within which the identification and assessment of substation site options could be completed (see **Figure 2**). The Area of Search was developed to encompass a range of feasible site options within close proximity to the Sloy Hydro Power Station as well as taking into account existing topographical and engineering constraints.

[3] CIRIA, CIEEM, IEMA (2019). Biodiversity Net Gain: Good practice principles for development, A Practical Guide. https://cieem.net/wp-content/uploads/2019/02/C776a-Biodiversity-net-gain.-Good-practice-principles-for-development.-A-practical-guide-web.pdf

[4] Scottish and Southern Electricity Networks (November 2020) Substation Site Selection Procedures for Voltages at or above 132 kV

3.2.2 The Area of Search is relatively small given the location of the power station in relation to Loch Lomond and its' surrounding topography. The area is defined by the following:

- To the north, the A82 alignment and local topographic features preclude suitable sites further away.
- To the west, the railway is the principal constraint which prevents sites sitting too nearby or uphill from it on stability grounds.
- To the east, the area is constrained by the A82 and Loch Lomond.
- To the south, the area is constrained by the holiday park, topography and the A82.

3.2.3 The Area of Search is located within Loch Lomond and Trossachs National Park and Loch Lomond National Scenic Area. Key sensitivities within the Area of Search include Loch Lomond waterbody, Loch Lomond Holiday Park, Loch Lomond Woods Special Area of Conservation (SAC) and ancient woodland habitat. The landscape character, visual amenity and heritage assets (including the Inveruglas Castle Scheduled Monument and several Listed Buildings) are key sensitives.

3.2.4 Settlement within the Area of Search consists of scattered farms and dwellings with the closest minor settlement, Tarbet, located 5 km to the south. Ardlui is located 5.7 km to the north of the Proposed Development.

3.2.5 The Proposed Development is connected by the A82, located to the west. The A82 is a visitor route through Loch Lomond and the Trossachs National Park and for visitors heading to and from the Highlands and Islands. The West Highland Line also passes to the west of the Proposed Development.

3.2.6 The Area of Search is located by Sloy Hydroelectric Power Station, the largest conventional hydroelectric power plant in the UK.

3.3 Baseline Conditions

3.3.1 A baseline desktop study has been carried out to identify a broad range of potential constraints and opportunities within the Area of Search, and its adjacent context. This has involved the following activities:

- Identification of environmental designated sites and other constraints, utilising GIS datasets available via the NatureScot Site Link[5];
- Identification of archaeological designations and other recorded sites, utilising GIS datasets available via Historic Environment Scotland and the Historic Environment Record[6,7,];
- Scottish Environment Protection Agency (SEPA) interactive Flood Risk Mapping[8];
- Review of the Loch Lomond and the Trossachs National Park Local Development Plan (LDP) 2017 - 2021[9], to identify further environmental constraints and opportunities, such as regional level designations or other locations important to the public;
- Review of landscape character assessments of relevance to the Area of Search[10];
- Review of Native Woodland Survey of Scotland and Ancient Woodland Inventory data sets[11];

[5] NatureScot. Site Link. [online] Available at: https://sitelink.nature.scot/home
[6] Historic Environment Scotland Data Services. *Portal*. [online] Available at: http://portal.historicenvironment.scot/
[7] Royal Commission on Ancient and Historical Monuments of Scotland. *Canmore*. [online] Available at: http://canmore.rcahms.gov.uk/
[8] Scottish Environmental Protection Agency. *SEPA Flood Maps* [online] Available at: http://map.sepa.org.uk/floodmap/map.htm
[9] Loch Lomond and the Trossachs Local Development Plan 2017-2021 https://www.lochlomond-trossachs.org/planning/planning-guidance/local-development-plan/
[10] Scottish Natural Heritage. (2019). *Scottish Landscape Character Types Map and Descriptions* [online] Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions
[11] Available at data.gov.uk

- Review of Ordnance Survey (OS) mapping (1:50,000 and 1:25,000 and online GIS data sources from OS OpenData) and aerial photography (where available) to identify other potential constraints such as settlement, properties, walking routes, cycling routes, etc.;
- Extrapolation of OS Vectormap GIS data to identify further environmental constraints including locations of watercourses and waterbodies, and roads classifications; and
- Review of other local information through online and published media such as tourism sites and walking routes.[12][13]

Site Visits

3.3.2 Site visits were carried out in June, July and August 2021 to enable an informed opinion on how the potential environmental effects identified during the baseline studies could influence potential site options.

3.4 Site Identification and Selection Methods

3.4.1 Seven potential substation site options were identified by SSEN Transmission within the Area of Search. Preliminary site selection was undertaken for a new substation site which involved a desktop exercise together with site walkovers. Option G from the initial options was discounted at an early stage as it conflicted with existing land uses.

3.4.2 In accordance with the steps outlined in SSEN Transmission's approach to substation site selection, the following considerations have been taken into account as far as is practicable at this stage and will be considered in more detail during subsequent assessments:

- Respect areas of high amenity value and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area;
- Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas;
- Use space effectively to limit the area required for development, minimising the effects on existing land use and rights of way;
- Alternative designs of substations may also be considered, e.g. 'enclosed', rather than 'open', where additional cost can be justified;
- Consider the relationship of substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints; and
- When siting substations take account of the effects of line connections that will need to be made.

3.4.3 In addition, principles of BNG and the mitigation hierarchy have been considered during the site selection process and will continue to inform detailed site design decisions as the project progresses.

3.5 Appraisal Method

3.5.1 Following the process defined in the 'Substation Site Selection Procedures for Voltages at or above 132kV' the appraisal of substation site options has involved systematic consideration against the topic areas included in **Table 3.1**.

Table 3.1: Topic Areas Considered

Category	Sub-Topic
Environmental Parameters	
Natural Heritage	Designations
	Protected Species

[12] Loch Lomond and the Trossachs https://www.lochlomond-trossachs.org/
[13] Loch Lomond and the Trossachs Core Paths Plan 2019 – 2017 https://www.lochlomond-trossachs.org/park-authority/publications/core-paths-plan/

Category	Sub-Topic
	Habitats (including BNG)
	Ornithology
	Hydrology, Geology and Hydrogeology
Cultural Heritage	Designations
	Cultural Heritage Assets
Landscape and Visual	Designations
	Landscape Character
	Visual
Land Use	Agriculture
	Forestry and Woodland
	Recreation
Planning	Policy
	Proposals
Engineering	
Connectivity	Existing circuits / network
	Future development possibilities
	Interface with SSE Distribution and Generation
	DNO Connection
Footprint Requirements	Technology
	Adjacent Land Use
	Space Availability
Hazards	Unique Hazards
	Existing Utilities
Ground Conditions	Topography
	Geology – Superficial Deposits (peat)
	Geology (site testing to verify properties)
Environmental Conditions	Elevation
	Salt Pollution
	Flooding
	Carbon Footprint
	SF6
	Contaminated Land
	Noise (proximity to dwellings / residential properties)
Construction Access	Substation Access Road
	Transformer Delivery Route
Operation and Maintenance	Access

3.5.2 Each substation site option has been considered in terms of its potential interaction with the environmental, engineering and economic characteristics, features and sensitivities. The substation site options have then been compared to determine which has the greatest and least capacity or potential to accommodate the Proposed Development.

RAG Rating

3.5.3 A Red-Amber-Green (RAG) rating has been applied to each topic area within each section, indicating potential constraints to development. A high-level convention for assigning RAG ratings is shown in **Table 3.2** below. More detailed guidance for topic specific considerations is included in Annex 8 of SSEN Transmission's substation site selection guidelines.

Table 3.2: RAG Ratings

Performance	Comparative Appraisal
Most Preferred  **Least Preferred**	Low potential for the development to be constrained
	Intermediate potential for the development to be constrained
	High potential for the development to be constrained

Identification of a Preferred Site Option

3.5.4 Following review of the potential site options, these environmental, technical and economic topics have been considered in combination to arrive at the Preferred Site Option. The overall objective throughout the appraisal of site selection options has been to take a balanced consideration of all criteria.

4. DESCRIPTION OF SITE OPTIONS

4.1.1 This section of the report describes each of the site options identified for high-level appraisal (see **Figure 2**). Site options have been identified to allow for subsequent refinement of the proposals. The site options assessed are listed below (in order from north to south) and described in the following section:

- **Option A** – This option is the most northernly of all the options and is located to the north of the existing Sloy Hydro Power Station. Option A is located in an area of woodland (also shown in **Plate 4.1**).

Plate 4.1 Site Option A

- **Option B** – This option is split into two substations, either side of the existing Sloy Hydro Power Station to the north and the south of the penstock. Both sections are located within areas of woodland (also shown in **Plate 4.2**).

Plate 4.2: Site Option B

- **Option C** – This option is located within an area of woodland and is adjacent to Sloy Hydro Power Station, close to a residential property (also shown in **Plate 4.3**).

Plate 4.3: Site Option C

- **Option D** – This option is located within an area of woodland and is located further to the south than Option C (also shown in **Plate 4.4**).

Plate 4.4: Site Option D

- **Option E** – This option is located partially within an area of woodland and predominately within a woodland clearing (also shown in **Plate 5.5**).

Plate 4.5: Site Option E

- **Option F** – This option is the furthest south of all the options and located within an area of clearing (also shown in **Plate 4.6**).

Plate 4.6: Site Option F

5. BASELINE CONDITIONS AND COMPARATIVE APPRAISAL

5.1.1 This section summarises the baseline and key constraints within the Area of Search and the surrounding area, with a particular focus on those constraints relevant to the site options under consideration. This section makes reference to **Plate 4.1 – Plate 4.6** which illustrate the various designations and environmental features discussed throughout.

5.1 Environmental Baseline

5.1.1 The following environmentally designated sites or areas are present within the Area of Search itself (see **Figures 3 to 8**).

- The Proposed Development is located within the designated site, Loch Lomond and the Trossachs National Park (LLTNP).
- Some of the site options are located within areas of Ancient Woodland (of semi-natural origin).
- Designated cultural heritage assets comprising Scheduled Monuments (SM) (Inveruglas Castle and Listed Buildings (LB) (such as Sloy Hydro Power Station).

5.1.2 The following sites are present within the 5 km wider study area.

- Ben Vorlich Site of Special Scientific Interest (SSSI) – approximately 1.2 km north west from the Area of Search (at its closest point).
- Glen Loin SSSI – approximately 2.1 km south of the Area of Search.
- Loch Lomond Woods Special Area of Conservation (SAC)– approximately 1 km east of the Area of Search.

5.1.3 The Area of Search is predominately made up of woodland habitat with some areas of scrub/grassland habitat. There is the potential for ground water dependent terrestrial ecosystems (GWDTE) within the Area of Search. Woodland habitat within the Area of Search could provide foraging/resting opportunities for a number of protected species (badger, red squirrel, pine marten, bat species). Adjacent riparian zones offer suitable habitat for otter, for which the Loch Lomond Woods SAC is designated. Proximity to the built structures of the existing substation provides the additional constraint of bat Potential Roosting Features (PRFs) PRFs within buildings.

5.1.4 There is the potential for the presence of golden eagle within the Area of Search. The golden eagle (a Schedule 1 listed species) is a qualifying feature for Glen Etive & Glen Fyne Special Protection Area (SPA) (approximately 23 km to the north west of the Area of Search). Other Schedule 1 birds have potential to have nesting territories within habitats within the Area of Search. Proximity to the existing substation buildings may provide a baseline level of disturbance that bird species have become habituated to. Habitats present within the Area of Search have potential to support numerous different breeding Birds of Conservation Concern (BoCC)[14] (including starling, redwing, mistle thrush, grey wagtail, yellowhammer). Nesting birds will utilise woodland, scrub, hedgerow habitat for nesting.

5.1.5 The Area of Search is located in the River Leven (Loch Lomond) Catchment[15]. Each of the Options are located within 500 m of Loch Lomond (North) which is classified as having a Water Framework Directive (WFD) status of 'Poor' in 2018. The Area of Search includes an unnamed burn which has not been characterised for WFD status by SEPA. The Area of Search to the east of the A82 is considered to be at high risk of surface water flooding based on SEPA's indicative flood risk mapping[16]. River flood risk extends from the banks of Loch Lomond to discrete locations west of the A82 in the Area of Search, including adjacent to the unnamed stream close to Option D. The resolution of the SEPA flood mapping limits the conclusions that can be determined for

[14] British Trust for Ornithology (2015) Birds of Conservation Concern 4: the Red List for Birds. Available at: https://www.bto.org/our-science/publications/psob

[15] Water Classification Hub, SEPA. Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/

[16] SEPA Interactive Flood Risk Mapping. Available at: https://map.sepa.org.uk/floodmaps

specific Options, with Options D and B in particular appearing to be in very close proximity to river flood risk zones. There is the potential for the presence of GWDTE in the area, however, the predominant sources of water in this location are anticipated to be rainfall, local watercourses and the adjacent influence of Loch Lomond.

5.1.6 Argyll and Bute Council has confirmed there are three Private Water supplies (PWS) located within 2 km of the Area of Search; Inveruglas Farm House, Loch Lomond Holiday Park and Inveruglas Visitor Centre / Sloy Power Station. There are no records of priority peatland habitats recorded within any Option. The National Soil Map of Scotland17 indicates the Area of Search is underlain by a geology of Humus-iron podzols.

5.1.7 Two Category A Listed buildings (Sloy Power Station including boundary walls, gates and gatepiers (LB43188); and Listed Feeder Pipes, Loch Sloy Hydro Electric Power Station, Inveruglas (LB43188)) are located within 200 m of the Area of Search. There are four Category C listed buildings within 200m of the Area of Search (Sloy Power Station, Bridge (LB43189); Sloy Power Station, Bungalow (LB43190); Inveruglas Barn (LB43186); and Inveruglas Steading (LB43187)). There are also 25 non-designated assets of archaeological and cultural heritage interest, classed in the HER within 200 m of the Options. For the purposes of the assessment, the non-designated assets are considered to be of local importance ('Locally Significant') and of low sensitivity.

5.1.8 The Area of Search lies within the LLTNP to which any development must have regard to the landscape's special qualities. These have been set out by NatureScot (formerly SNH) in 2010[18], and are further reiterated in the LLTNP Authority's (LLTNPA) Local Development Plan 2017-2021 under its Natural Environment Policy 1: National Park Landscapes, Seascape and Visual Impact. Of particular relevance to the Area of Search is the presence and importance of the woodlands, noting these occur within and adjacent to the Area of Search.

5.1.9 The Area of Search lies within NatureScot's 2019 Landscape Character Assessment[19] - Straths and Glens with Lochs Landscape Character Type (LCT) (no.254). The Highland Summits LCT (no.251) lies on the higher ground either side of Loch Lomond at the Area of Search, and the Upland Glens LCT (no.252) lies along Inveruglas Water between Loch Sloy and Loch Lomond, south and west of the Area of Search. Characteristics of the Highland Summits LCT which surrounds the Area of Search on the higher ground would be sensitive to the type of development proposed. This generally relates to the distinctiveness of the mountain forms, such as Ben Vorlich (to the north west of Sloy), extensive views available from these summits, and potential to affect the wild character of those potentially more distant peaks. Due to topography, woodland cover and orientation of the glen between Loch Sloy and Loch Lomond it is anticipated there would be very little intervisibility between the Upland Glens LCT and the Area of Search. It is therefore not a key LCT to consider.

5.1.10 The Area of Search lies within a busy part of Loch Lomond, with numerous sensitive visual receptors and is an area of high recreational interest. Inveruglas Visitor Centre (café, toilets, parking for walkers, viewpoint) is located to the west of the Area of Search which also features Inveruglas Pyramid. Two long distance routes, the Three Lochs Way and Cowal Way are located to the south of the Area of Search, along the A82. Walkers on the West Highland Way (opposite side of Loch Lomond) is also a sensitive visual receptor in the area. Tourist traffic would be located along the A82 as this road is one of the main roads around Loch Lomond and is a key access route for tourists from the central belt and south to the highlands. Loch Lomond is a popular location for fishing activities, with some stalking activities occurring within the wider Loch Lomond area. Local residents in properties directly east and south (off the A82) to the Area of Search are sensitive visual receptors. Further sensitive receptors include users of ferry/boats that visit Inveruglas jetty and routes along this northern end of Loch Lomond.

[17] National Soil Map of Scotland interactive mapping. Available at: https://map.environment.gov.scot/Soil_maps/?layer=1

[18] Scottish Natural Heritage & LLTNPA (2010) The special qualities of the Loch Lomond and The Trossachs National Park, SNH Commissioned Report, No.376.

[19] [19] Scottish Natural Heritage. (2019). *Scottish Landscape Character Types Map and Descriptions* [online] Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

5.1.11 There is a holiday park, Loch Lomond Holiday Park, to the south of Invergulas Water but from site survey it is clear it is sheltered from direct views towards the existing Sloy Power Station and would not have any visibility of the Area of Search. The area is largely characterised by woodland (both native woodland and non-native woodland) and scrub/grassland habitat. The Area of Search is not located within any commercial forestry areas.

5.2 Engineering Baseline

5.2.1 Sloy Hydro Power Station site is located towards the north of the Area of Search. At the north of the Area of Search the A82 road and topography prevents more site options to be investigated in this location. There are existing OHL towers located to the north of the Area of Search.

5.2.2 The Network Rail asset is located to the west of the Area of Search, this presents challenges of ownership issues.

5.2.3 The existing private property located to the east of the Area of Search constrains the site selection options.

5.2.4 A spate watercourse is located towards the south of the Area of Search which is an engineering constraint.

5.3 Environmental Appraisal

5.3.1 All Options are located within the LLTNP and have a similar level of constraints with other designated sites. There are no regional or local designations covering any of the Options. Options A and F do not contain any ancient woodland and are therefore considered the more preferred options. Therefore Options A and F have been allocated a **Green** RAG rating. All other Options have been allocated an **Amber** RAG rating.

5.3.2 The majority of the Options (with the exception of Option F) are located within an area of woodland habitat. Therefore, these areas provide suitable habitat for a number of protected species including badger, red squirrel, pine marten and bat species. There is also the potential for adjacent riparian zones to offer a suitable habitat for otter. Option A has a low potential for constraints with habitats as this Option is not a suitable habitat for UK Biodiversity Action Plan species on the red and amber list as well as the fact it is not located within an area of ancient woodland. As Option F is not located within an area of woodland and therefore is less likely to support protected species this Option has been allocated a **Green** RAG rating. All other Options have been allocated an **Amber** RAG rating.

5.3.3 Herpetofauna likely to be present on site include reptile species (adder, slow worm, common lizard). These species prefer areas with a mix of open ground, scrub, and woodland edge habitat. Therefore Options E and F are most likely to provide suitable habitat. No freshwater ponds are located within 1 km of the site, therefore great crested newt (GCN) are not considered a constraint to the Proposed Development. Options A and F are preferred due to the absence of any ancient woodland or annex 1 habitats. There is the potential for the presence of GWDTE in the study area. Options within an area of woodland (B, C, D and E), are less likely to have areas of GWDTE. Therefore, Option A has been allocated a RAG rating of **Green** due to the low potential of reptiles and Annex 1 species. All other Options have been allocated a RAG rating of **Amber.**

5.3.4 Habitats present across all Options have the potential to support breeding territories of a number of different Schedule 1 or BoCC. The proximity of the existing substation to Option B is the only distinguishing feature that could limit this as a potential constraint due to baseline disturbance levels. Therefore, Option B has been allocated a RAG rating of **Green.** All other Options have been allocated a RAG rating of **Amber**.

5.3.5 All options are likely to be subject to the same level of constraints as they are all:

- located within 500 m of Loch Lomond;
- located within a Surface Water and Groundwater Drinking Water Protected;
- located within the same distance from Scottish Water and SEPA assets; and

- underlain by a geology of Humus-iron podzols and no area of Class 1 or 2 peatland habitat.

5.3.6 Option A and Option F are however closest to PWS - Inveruglas Visitor Centre / Sloy Power Station and Loch Lomond Holiday Park respectively. Flood risk has been noted, with Options D and B located within/adjacent to medium and high river flood risk zones, respectively. A precautionary RAG rating of **Amber** has been applied for Option D and Option E based on proximity within 50 m of the unnamed stream and associated medium flood risk zone, with the same rating for Option B, due to proximity to the high flood risk zone close to the A82. Other Options (A, C, F) are considered to be rated as **Green**, on the basis that they do not appear to be within or immediately adjacent to the SEPA flood risk zones.

5.3.7 All Options are located on what is thought to be the original route of the Tarbert-Crianlarich Military Road (WoSAS ID 12423/12425) and Inveruglas, Loch Sloy Hydroelectric Construction Camp (Canmore ID 348577). All of the substation options have been allocated RAG ratings of **Amber**. On balance, taking into consideration the known assets within and around each site, Option F is slightly preferred in terms of potential effects on cultural heritage. Option F is furthest from the Category A Listed Power Station and will be partially screened by the woodland. It is also the preferred option for reducing impacts on the Inveruglas Barn and Steading.

5.3.8 The Options with the least potential to significantly affect the special qualities of the LLTNP are Option E and Option F. This is due to the limited tree loss taking into account that woodland in this area forms a key part of the special qualities of the LLTNP. In addition, the screening that would be retained along the A82 would limit the visual influence within the LLTNP. Options E and F have been allocated a RAG rating of **Green**. The options closer to the road and which create loss of woodland would have a detrimental impact on the special qualities of the LLTNP. These Options (A, B, C and D) have therefore been allocated a RAG rating of **Red.**

5.3.9 The Options with the least potential to significantly affect the character of the local and wider landscape are Option E and F. These locations within the clearing to the south would create least impact on the woodland which forms a key characteristic of the landscape in this area. Options E and F have been allocated a RAG rating of **Green**. The options closer to the road and which create loss of woodland would have a detrimental impact on the landscape character of this area. These Options (A, B, C and D) have therefore been allocated a RAG rating of **Red.**

5.3.10 The Options with the least potential to significantly affect the visual amenity of the identified sensitive visual receptors (local residents, walkers, visitors, users of the A82, users of boats on the Loch) would be Options D, E and F. This is due to the depth of woodland that would be retained between the visual receptors and the Proposed Development which would provide screening. A RAG rating of **Green** has been allocated to Options D, E and F. The other options would be closer to the A82 and residential properties with limited potential for retaining woodland. As such, they would be much more openly visible with the potential to create significant visual impacts on a number of visual receptors. Options B and C have been allocated a RAG rating of **Red** and Option A has been allocated a RAG rating of **Amber.**

5.3.11 A RAG rating of **Green** has therefore been allocated to all substation site options for agricultural impacts, given that they all sit within areas of non-productive agricultural land. None of the substation sites are located within areas of commercial forestry. Site options A to D are all located in areas of woodland, with option A and B in areas of native woodland. As these options would require total loss of woodland for the area of the site, these sites have been allocated a RAG rating of **Red.** Site option E is located partially within areas of native woodland and partially within the clearing and has therefore been allocated a RAG rating of **Amber**. Site option F is located in an area of woodland clearing and therefore would not require any woodland loss. This option is allocated a RAG rating of **Green.**

5.3.12 Two long distance routes, the Three Lochs Way and Cowal Way, and a core path are located to the east of the Area of Search along the A82. As no sites would interact with these paths, all substation options were allocated

a RAG rating of **Green.** As none of the substation options are located in areas of commercial highland sports (e.g. stalking or fishing), they are all allocated a RAG rating of **Green.**

5.3.13 Adherence to National, Regional and Local planning policy will in large part depend on avoiding or minimising potential constraints noted, particularly in relation to potential impacts on the natural environment. Given that the Proposed Development is located within the LLTNP, it will have to be in accordance with Renewable Energy Policy 1: Hydro Energy of the LDP. As such it has been allocated a RAG rating of **Amber**. This reflects the lack interaction between the options and designated sites and that any potential conflicts with planning policies are likely avoidable through careful siting and design.

5.3.14 There are plans for a pumped storage site adjacent to Option A, therefore that option has been allocated an Amber RAG rating. As there are no other planning proposals on the remainder of the substation Options, all other site options have therefore been allocated a **Green** RAG rating.

5.4 Engineering Appraisal

5.4.1 For connectivity to existing circuits / network, Option A is the Option located within the closest proximity to the existing Sloy Hydro Power Station site, therefore it is easiest to extend the existing 132 kV overhead line. Option A has therefore been allocated a RAG rating of **Green**, all other Options have been allocated an **Amber** RAG rating. For connectivity to the existing 11 kV network, Option B is the preferred option as there is congestion of the 11 kV cable routes at the Power Station. Option B therefore has been allocated a RAG rating of **Green**, all other options have been allocated an **Amber** RAG rating. For outages with regard to modification to existing circuits, all options will be conducted via an offline build and present similar outage challenges when connecting to the new site. Therefore, all options have been allocated a **Green** RAG rating for outages for modification to existing circuits.

5.4.2 In terms of future development possibilities, Option F provides the largest area of open space and flat ground to provide the potential for future extension. Option F has therefore been allocated a **Green** RAG rating, Option E also has a **Green** RAG rating. Option A and B have been allocated a RAG rating of **Red** and Option C and Option D have been allocated a RAG rating of **Amber**.

5.4.3 Consideration of Business Separation and whole system generation requirements have allocated Options C, D, E, and F a RAG rating of **Green.** Options A and B may not provide suitable business separation mitigations and present an additional risk of interference with future pumped storage proposals, therefore these Options have been allocated a RAG rating of **Red**. In terms of Business Separation and whole system distribution requirements, Option A, B and C have been allocated a RAG rating of **Amber**. Options D, E and F have been allocated a **Green** RAG rating.

5.4.4 For the proximity of Low Voltage Alternate Current (LVAC) supplies, all options have been allocated a RAG rating of **Green** as they will be Earthing Auxiliary Transformer derived and not Distribution Network Operator (DNO).

5.4.5 The technological footprint requirements have been allocated a RAG rating of **Green** as the footprint for all options has been considered for full sized bays for 4x GTS. There is an opportunity to rationalise the size at a later design stage.

5.4.6 In terms of temporary availability for ancillary infrastructure (such as welfare compounds and laydown areas), Options A and B will require a remote laydown area for welfare facilities. Therefore, Options A and B have been allocated a RAG rating of **Amber**. Options E and F provide the best opportunities for on site welfare facilities and laydown areas, thereby being allocated a RAG rating of **Green**. Options C and D have also been allocated a RAG rating of **Amber**. In terms of permanent availability for ancillary infrastructure (such as screening and Sustainable Urban Drainage Systems (SuDS)), Options A, B and C have been allocated a RAG rating of

Amber. Options D, E and F have been allocated a RAG rating of **Green** due to the reduced requirement of tree clearing.

5.4.7 When considering the footprint requirement of space availability, Option B may require a large retaining wall which would interfere with the existing Network Rail boundary. This Option has therefore been allocated a RAG rating of **Red**. Options A, C and D have been allocated a RAG rating of **Amber**, whereas Options E and F have been allocated a RAG rating of **Green**.

5.4.8 For unique hazards, Options A, B and C have an unknown ground make up and unknown slope stability. Interference with Network Rail assets presents another unique hazard for Options A, B and C as they are within close proximity to private property. Options A and C therefore have been allocated a RAG rating of **Amber**. Options D and E have a burn crossing within the Option, therefore considered to be a unique hazard. Options B, D and E have been allocated a RAG rating of **Red**. Option F has been allocated a RAG rating of **Green.** When considering existing utilities, all options have been allocated a **Green** RAG rating as the existing utilities are minimal and achievable DNO and telecommunication diversions are required for all sites.

5.4.9 Options A and B are the least preferred Options in terms of existing topography and have therefore been allocated a RAG rating of **Red**. All other options have been allocated a RAG rating of **Amber**. Option A is the only Option with the potential for peat, therefore this option has been allocated a RAG rating of **Amber.** All other options have been allocated a RAG rating of **Green** for peat.

5.4.10 Site elevation, salt pollution and SF6 have all been allocated a RAG rating of **Green** for all options.

5.4.11 Options D and E have the highest flooding risk due to proximity to the burn and overland flow. Option D is lower lying in comparison to Option E. However, both of these Options have been allocated a RAG rating of **Red.** Option C is preferred, being allocated a RAG rating of **Green**. The remaining three Options (Option A, B and F) have been allocated a RAG rating of **Amber**.

5.4.12 The carbon footprint of Options E and F has been allocated as **Green** due to the availability and commuting distance to the proposed site compound and import requirements. Options A and B have been allocated a RAG rating of **Red**, whereas Options C and D have been allocated a RAG rating of **Amber**.

5.4.13 Options E and F are positioned at historic worker camps used to build the hydro station. Contamination will be captured in ground investigation and environmental studies. It is possible that all Options are contaminated due to construction of the hydro station, therefore all options have been allocated a RAG rating of **Amber**.

5.4.14 Option C is located in closest proximity to the residential property on site, therefore this Option has been allocated a RAG rating of **Red** for noise. All other Options have been allocated a RAG rating of **Amber**.

5.4.15 Construction access for all Options have been allocated a RAG rating of **Green** due to easy access from the A82 and will all have the same transformer delivery route.

5.4.16 When considering access for operation and maintenance Option B has been allocated a RAG rating of **Amber**, all other options have been allocated a RAG rating of **Green.**

5.5 Comparative Analysis

5.5.1 **Table 6.1** below summarises the environmental and technical appraisal RAG ratings for the substation site options considered within this section.

Table 6.1: RAG Comparison Table

Substation Site Options								
Category	**Sub-Topic**		**Option A**	**Option B**	**Option C**	**Option D**	**Option E**	**Option F**
Environmental								
Natural Heritage	Designations							
	Protected Species							
	Habitats							
	Ornithology							
	Geology, Hydrology and Hydrogeology							
Cultural Heritage	Designations							
	Cultural Heritage Assets							
Landscape and Visual	Designations							
	Character							
	Visual							
Land Use	Agriculture							
	Forestry							
	Recreation							
Planning	Policy							
	Proposals							
Engineering								
Connectivity	Existing circuits / network	Distance and feasibility of connecting to the existing circuits / network (132)						
		Distance and feasibility of connecting to the existing circuits / network (11)						
		Outages for modification to existing circuits						
	Future development possibilities	Extension of site or other circuits						
	Interface with SSE Distribution and Generation	Consideration of Business Separation and whole system requirements (generation)						

Substation Site Options									
		Consideration of Business Separation and whole system requirements (distribution)							
	DNO Connection	Proximity of LVAC supplies							
Footprint Requirements	Technology	i.e. AIS/GIS or certainty of sizing on non-standard plant and equipment							
	Adjacent Land Use	Availability for ancillary infrastructure like welfare compounds, laydown areas (TEMP)							
		Availability for ancillary infrastructure like screening and SUDS infrastructure. (PERMANENT)							
	Space Availability	Non-standard substation configurations to accommodate site specific considerations							
Hazards	Unique Hazards								
	Existing Utilities								
Ground Conditions	Topography								
	Geology – Superficial Deposits (peat)								
	Geology (site testing to verify properties)								
Environmental Conditions	Elevation								
	Salt Pollution								
	Flooding								
	Carbon Footprint								
	SF6								
	Contaminated Land								
	Noise (proximity to dwellings / residential properties)								
Construction Access	Substation Access Road								
	Transformer Delivery Route								
Operation and Maintenance	Access								

5.6 Preferred Substation Site Option

5.6.1 A Preferred Substation Site Option has been identified following consideration of environmental and engineering considerations.

5.6.2 The comparative analysis of the six substation site options has highlighted that Options B and C have a high potential for the development to be constrained by landscape designations, character and visual impacts due to the loss of woodland for screening. Options A and D also have a high potential for the development to be constrained by landscape designations and the impact to landscape character areas. Options A to D would also have an increased negative impact to the woodland due to the level of required felling for the substation footprint.

5.6.3 Option F has a low potential for impacts to designated ecological sites and protected species as it is not located in an area of woodland. Option A also has a low potential for impacts to designated ecological sites due to the fact it is not located within ancient woodland. All other options have a moderate potential for constraints. Option A has a low potential for constraints with habitats as this Option is not a suitable habitat for UK Biodiversity Action Plan species on the red and amber list as well as the fact it is not located within an area of ancient woodland. All other options have identified moderate constraints. Option B has a low potential of constraints for ornithology due to the existing disturbance of the Sloy Hydro Power Station. All other options have a moderate potential of constraints for ornithology.

5.6.4 Option A and B perform worst in terms of future development possibilities, interface with SSE Distribution and Generation, topography and the carbon footprint. Whereas Options E and F perform the best in terms of future development possibilities, adjacent land use, space availability, and carbon footprint. Overall, Option F performs the best in terms of engineering constraints, with Option E performing the second best.

5.6.5 **Substation Site Option F has been identified as the preferred substation option given the engineering and environmental appraisal.**

5.6.6 The Preferred Substation Site Option taken forward to detailed design would require careful consideration of potential mitigation opportunities to achieve an acceptable design with minimal environmental effects, particularly with respect to potential visual effects and proximity to dwellings.

6. CONSULTATION ON THE PROPOSALS

6.1.1 SHE Transmission places great importance on, and is committed to, consultation and engagement with all parties, or stakeholders, likely to have an interest in proposals for new projects such as this. Stakeholder consultation and engagement is an essential part of an effective development process.

6.2 Questions for Consideration by Consultees

6.2.1 When providing comments and feedback on this Consultation Document, SHE Transmission would be grateful for your consideration of the questions below:

- Has the requirement for the project been clearly explained?
- Based on the information provided do you have a preferred and/or worst site location?
- Are there any additional factors, or environmental features that you consider important and should be brought to the attention of the project team?

6.3 Next Steps

6.3.1 Virtual online consultation events have been held, as detailed in the preface of this document. The responses received from these consultation events, and those sought from statutory consultees and other key stakeholders, will inform further consideration of the site options put forward and the confirmation of the Preferred Substation Site Option.

6.3.2 All comments are requested by Tuesday 28th September 2021. A Report on Consultation will be produced which will document the consultations received, and the decisions made in light of these responses.

6.3.3 The outcome of the substation site selection process will be a development for which consent under the Town & Country Planning regime will be sought. The application will identify:

- The site boundary clearly shown in red (the Planning Red Line Boundary) including any access route (up to the public road including junction improvements).
- The Proposed Development in relation to the site boundary with dimensions of all permanent structures, buildings, perimeter fencing, and any key drainage features (SuDS pond) and key electrical features, such as transformers.

6.3.4 In some cases, the application will be subject to Environmental Impact Assessment (EIA) under the Town & Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. This may result in further alterations to the Proposed Development to reflect outcomes of the EIA consultation process. Should the Proposed Development be deemed non-EIA (due to its scale or number and significance of potential environmental effects), a voluntary Environmental Appraisal is carried out to support the application.

6.3.5 Further public and stakeholder consultation will be undertaken to present our proposals ahead of submitting a planning application.

6.3.6 Where overhead line elements are required, a similar application is made to the Scottish Ministers under Section 37 of the Electricity Act 1989. This will specifically cover the overhead line, not the main substation work

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710000

N

Pollochro Woods - SSSI

Loch Lomond Woods - SAC

Pulpit Rock - SM

Ben Vorlich - SSSI

Island I Vow - SM

The Great Trossachs Forest - NNR

Loch Lomond and The Trossachs National Park

Inveruglas Castle - SM

Loch Lomond - NSA

Craig Royston Woods - SSSI

Glen Loin - SSSI

Loch Lomond Woods - SAC

Loch Lomond Woods - SAC

Ben Lomond - SSSI

Rowardennan Woodlands - SSSI

230000

Legend

- Option A
- 5km Buffer
- National Park
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- National Scenic Area (NSA)

Listed Buildings Category

- A
- B
- C
- Scheduled Monument (SM)
- Core Path

0 1 2 Km

Rev	Date	By	Comment
A	13/07/2021	MC	First Issue.

Scottish & Southern Electricity Networks

TRANSMISSION

Sloy Substation Site Selection

Figure 3: Environmental Constraints Option A

Drg No	SLOY_WSP_A_002
Rev	A
Date	15/07/2021
Scale	1:38,000 @ A3

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Pollochro Woods - SSSI

Loch Lomond Woods - SAC

Pulpit Rock - SM

Ben Vorlich - SSSI

Island I Vow - SM

The Great Trossachs Forest - NNR

Loch Lomond and The Trossachs National Park

Inveruglas Castle - SM

Loch Lomond - NSA

Craig Royston Woods - SSSI

Glen Loin - SSSI

Loch Lomond Woods - SAC

Loch Lomond Woods - SAC

Ben Lomond - SSSI

Rowardennan Woodlands - SSSI

230000

Legend

- Option B (North and South)
- 5km Buffer
- National Park
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- National Scenic Area (NSA)

Listed Buildings Category

- A
- B
- C
- Scheduled Monument (SM)
- Core Path

0 1 2 Km

Rev	Date	By	Comment
A	13/07/2021	MC	First Issue.

Scottish & Southern Electricity Networks

TRANSMISSION

Sloy Substation Site Selection

Figure 4: Environmental Constraints Option B (North and South)

Drg No	SLOY_WSP_A_003
Rev	A
Date	15/07/2021
Scale	1:38,000 @ A3

230000

710000

N

Pollochro Woods - SSSI

Loch Lomond Woods - SAC

Pulpit Rock - SM

Ben Vorlich - SSSI

Island I Vow - SM

The Great Trossachs Forest - NNR

Loch Lomond and The Trossachs National Park

Inveruglas Castle - SM

Loch Lomond - NSA

Craig Royston Woods - SSSI

Glen Loin - SSSI

Loch Lomond Woods - SAC

Loch Lomond Woods - SAC

Ben Lomond - SSSI

Rowardennan Woodlands - SSSI

230000

Legend

- Option C
- 5km Buffer
- National Park
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- National Scenic Area (NSA)

Listed Buildings Category

- A
- B
- C
- Scheduled Monument (SM)
- Core Path

0 1 2 Km

Rev	Date	By	Comment
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TRANSMISSION

Sloy Substation Site Selection

Figure 5: Environmental Constraints Option C

Drg No	SLOY_WSP_A_004
Rev	A
Date	15/07/2021
Scale	1:38,000 @ A3

230000

710000

N

Pollochro Woods - SSSI

Loch Lomond Woods - SAC

Pulpit Rock - SM

Ben Vorlich - SSSI

Island I Vow - SM

The Great Trossachs Forest - NNR

Loch Lomond and The Trossachs National Park

Inveruglas Castle - SM

Loch Lomond - NSA

Craig Royston Woods - SSSI

Glen Loin - SSSI

Loch Lomond Woods - SAC

Loch Lomond Woods - SAC

Ben Lomond - SSSI

Rowardennan Woodlands - SSSI

230000

Legend

- Option D
- 5km Buffer
- National Park
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- National Scenic Area (NSA)

Listed Buildings Category

- A
- B
- C
- Scheduled Monument (SM)
- Core Path

0 1 2 Km

Rev	Date	By	Comment
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TRANSMISSION

Sloy Substation Site Selection

Figure 6: Environmental Constraints Option D

Drg No	SLOY_WSP_A_005
Rev	A
Date	15/07/2021
Scale	1:38,000 @ A3

230000

710000

N

Pollochro Woods - SSSI

Loch Lomond Woods - SAC

Pulpit Rock - SM

Ben Vorlich - SSSI

Island I Vow - SM

The Great Trossachs Forest - NNR

Loch Lomond and The Trossachs National Park

Inveruglas Castle - SM

Loch Lomond - NSA

Craig Royston Woods - SSSI

Glen Loin - SSSI

Loch Lomond Woods - SAC

Loch Lomond Woods - SAC

Ben Lomond - SSSI

Rowardennan Woodlands - SSSI

230000

Legend

- Option E
- 5km Buffer
- National Park
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- National Scenic Area (NSA)

Listed Buildings Category

- A
- B
- C
- Scheduled Monument (SM)
- Core Path

0 1 2 Km

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TRANSMISSION

Sloy Substation Site Selection

Figure 7: Environmental Constraints Option E

Drg No	SLOY_WSP_A_006
Rev	A
Date	15/07/2021
Scale	1:38,000 @ A3

230000

710000

N

Pollochro Woods - SSSI

Loch Lomond Woods - SAC

Pulpit Rock - SM

Ben Vorlich - SSSI

Island I Vow - SM

The Great Trossachs Forest - NNR

Loch Lomond and The Trossachs National Park

Inveruglas Castle - SM

Loch Lomond - NSA

Craig Royston Woods - SSSI

Glen Loin - SSSI

Loch Lomond Woods - SAC

Loch Lomond Woods - SAC

Ben Lomond - SSSI

Rowardennan Woodlands - SSSI

230000

Legend

- Option F
- 5km Buffer
- National Park
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- National Scenic Area (NSA)

Listed Buildings Category

- A
- B
- C
- Scheduled Monument (SM)
- Core Path

0 1 2 Km

Rev	Date	By	Comment
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Sloy Substation Site Selection

Figure 8: Environmental Constraints Option F

Drg No	SLOY_WSP_A_007
Rev	A
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Scale	1:38,000 @ A3