Scottish & Southern Electricity Networks

TRANSMISSION

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Alignment Selection Consultation Document

Quoich OHL Replacement

June 2023

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CONTENTS

Glossary

Term	Definition
Area of Search (Study Area)	A broad geographical area within which possible sites might be capable of identification within approximately 5km of the required connectivity point; usually determined by geographical features such as coastlines or hill/mountain ranges, or designation boundaries, such as National Park boundaries.
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.
Kilovolt (kV)	One thousand volts.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel structures or poles.
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission works.
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.
The National Grid	The electricity transmission network in Great Britain.
Works	Constructing new transmission infrastructure such as substations, overhead lines, underground cables, major refurbishment of these, the dismantling and removal of any parts of the system; and associated works, which may include formation of access tracks, bridge and road improvements, tree cutting, drainage etc.

1 Introduction

1.1.1 This document has been prepared by Scottish and Southern Electricity Networks Transmission (SSEN Transmission) to invite comments from all interested parties on the Optimal Alignment for a new 132 kilovolt (kV) overhead line (OHL) connecting the existing Quoich Tee Power Station and SSEN's Skye Reinforcement project (hereafter referred to as the 'Proposed Development').

1.1.2 This Document describes the alignment selection process followed, Alignment Options identified, the appraisal undertaken, and the suggestion for an Optimal Alignment. In publishing this document we are facilitating a more condensed format for public and statutory consultees to help enable access information previously presented within Consultation Documents and one which enables a wide range of information about the project to be easily accessible.

2 Project Background and Need

2.1.1 SSEN Transmission, operating under licence held by Scottish Hydro Electric Transmission plc, owns, operates and develops the high voltage electricity transmission system in the north of Scotland. SSEN Transmission holds a license under the Electricity Act 1989 and has a statutory duty under Schedule 9 of the Electricity Act 1989 to 'develop and maintain an efficient, co-ordinated and economical electricity transmission system in its licensed areas'. It is obliged to offer non-discriminatory terms for connection to the Transmission system both for new generation and for new sources of electricity demand.

2.1.2 SSEN Transmission is proposing to replace the existing OHL between Quoich Power Station and the Skye Reinforcement Project. The new OHL will allow for fault protection within the Skye Reinforcement project's proposed OHL upgrade.

3 Project Overview

3.1.1 SSEN Transmission is proposing to construct a new 1.1 km 132 kV OHL, between Quoich Tee Power Station and the future Skye Reinforcement Project.

3.1.2 Generally, the height, including extensions, for the Steel Lattice towers is between 25 m and 34 m. This is dependent on ground profile and span lengths; each extension is manufactured in 3 m increments. The selection of the supports suitable for the OHL are being considered separately to the OHL routeing process.

3.1.3 The final designation of support type is generally dependent on three main factors: altitude, weather and the topography of the route. The size of supports and span lengths will also vary depending on these factors, with supports being closer together at high altitudes to withstand the effects of greater exposure to high winds, ice and other weather events. Nominal span lengths for the L7c Towers are approximately 250 – 280 m with some possibilities of reaching 300 m depending on factors described. The support configuration, height and the distance between supports will therefore only be fully determined after a detailed alignment survey.

3.1.4 The proposed Lattice Towers will support three conductors (wires) each side on three insulators positioned at the side of the Tower Arm. Typical designs for this structure can be seen in **Figure 1**.

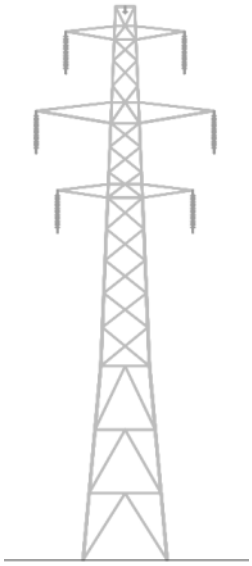

Figure 1 – Typical Steel Lattice Tower Design

3.1.5 Following identification of an Optimal Alignment for the OHL, a detailed topographical survey will be carried out. This is required to identify the positions and heights of each individual tower. Site investigations to examine the ground makeup and geology will also be carried out at proposed tower positions where required. These will inform the support foundation designs.

Construction Activities

3.1.6 Construction activities are anticipated to consist of six phases, as follows:

- Alterations to the existing transmission and distribution networks;
- Enabling work (e.g. forestry or scrub clearance and establishment of temporary construction compound(s);
- Erection of support structures;
- Conductor stringing (including construction of temporary scaffolding);
- Inspections and OHL commissioning; and
- Removal of temporary works and site reinstatement.

3.1.7 An indicative programme can be found in **Section 3.1.12** below.

3.1.8 All construction activities will be undertaken in accordance with a Construction Environmental Management Plan (CEMP) which will define specific methods for environmental survey, monitoring and management throughout construction. A CEMP will be produced by the Principal Contractor and agreed with statutory stakeholders prior to the commencement of construction.

Forestry Removal

3.1.9 Any woodland removal which may be required prior to the construction work will be identified and described after a Proposed Alignment has been identified and micrositing of infrastructure has been undertaken to avoid as much woodland as possible. Any removal of sections of commercial forest would be undertaken in consultation with Scottish Forestry and affected landowners. After felling, any timber removed that is commercially viable would be sold and the remaining forest material would be dealt with in a way that delivers the best practicable environmental outcome and is compliant with waste regulations. The methods of woodland removal and management of timber would be

described in a Woodland Management Document in-line with The UK Forestry Standard[1] guidance, to be prepared as part of the application for consent under Section 37 of the Electricity Act 1989, as amended.

Access during Construction

3.1.10 Vehicle access via temporary access tracks is required to each support structure location during construction to allow excavation and creation of foundations and erection of the support structure. Existing tracks would be used where possible and upgraded as required. Preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary track solutions in boggy / soft ground areas to reduce any damage to, and compaction of, the ground. These journeys would be kept to a minimum to minimise disruption to habitats along the route. Temporary access panel solutions may also be used to protect the ground, however, temporary stone tracks are likely to be necessary in some areas depending on existing access conditions, terrain and altitude. Helicopters may also be used to reduce access track requirements.

Programme

3.1.11 It is anticipated that construction of the Proposed Development would take place over a 12 month period, following the granting of consents, although a detailed programming of works would be the responsibility of the Principal Contractor in agreement with SSEN Transmission.

3.1.12 Construction is estimated to start in May 2025 with completion in May 2026.

4 Optioneering Process

4.1.1 The optioneering process has followed formal internal guidance[2] to enable consistent and rigorous selection of alignments and sites for new OHL connections. Each process has a number of key stages, each increasing in detail and definition and bringing technical, environmental and cost considerations together in a way which seeks the best balance in accordance with our Transmission Network Operator's Licence and the Electricity Act 1989. An overview of the Optioneering Process is provided as **Figure 2**.

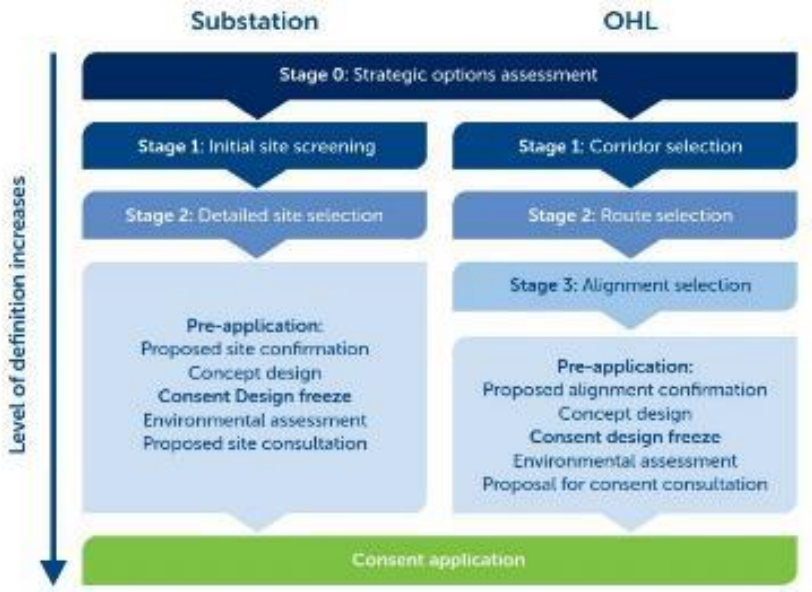

Figure 2 – Optioneering Process

[1] The UK Forestry Standard 4th Edition (2017); The Governments' approach to sustainable forestry. [online]. Available at: https://www.gov.uk/government/publications/the-uk-forestry-standard (Accessed 14 June 2022).

[2] SSEN Transmission (March 2018), Procedures for Routeing Overhead Lines of 132kV and above (updated in September 2020)

5 Stages 0 - 2: Strategic Options Assessment and Route Selection

5.1.1 A strategic options assessment and condition assessment has been undertaken by SSEN Transmission which noted that the infrastructure in the area needed to be replaced. This included replacing the existing OHL between Quoich Power Station and Quoich Tee Switching Station to connect the power station to the wider electricity network.

5.1.2 The Strategic Options Assessment (SOA) for the project determined that for a connection of this length and scale an underground cable (UGC) is not a feasible option due to costs involved during construction as well as ongoing maintenance problems associated with underground cables in remote areas including terrain, access and the presence of watercourses and associated flood zones, potential undesignated assets and peat. The UGC option would require large amounts of peat removal along the route. For protection purposes, two circuits would have to be installed. UGC installation in peat is also not recommended although it is feasible, it can prove expensive, technically challenging and result in programme delays.

5.1.3 Due to the length of the OHL, the route options are limited. As such, SSEN Transmission has not undertaken a formal routing selection process and has proceeded straight to alignment.

6 Stage 3: Alignment Selection

6.1.1 The approach to alignment selection, in identifying and assessing alternative OHL alignments, has been informed by the staged approach set out in the SSEN Transmission's Routeing Guidance[2]. The guidance develops a process which aims to balance environmental, technical and economic considerations.

6.1.2 Appraisal of Alignment Options has followed the process defined in the SSEN Transmission's Routing Guidance, including the topics considered within. This involved systematic consideration of the environmental, engineering and economic characteristics.

6.1.3 Four feasible Alignment Options were identified within the search area using publicly available data and Multi Criteria Analysis (MCA) to provide information about key constraints to the siting of the substation. The location of the 4 Alignment Options are shown on **Figure 3** and the locations of key environmental constraints are shown on **Figure 4**.

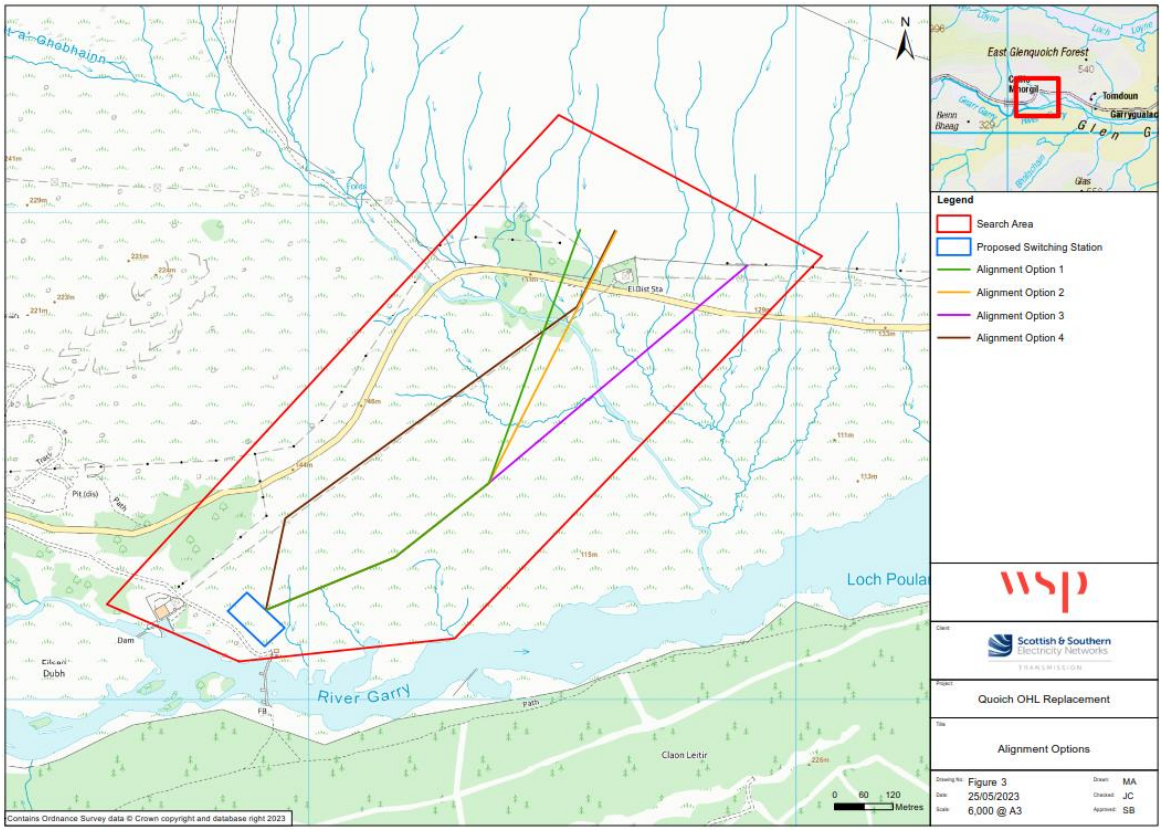

Figure 3 – Alignment Options

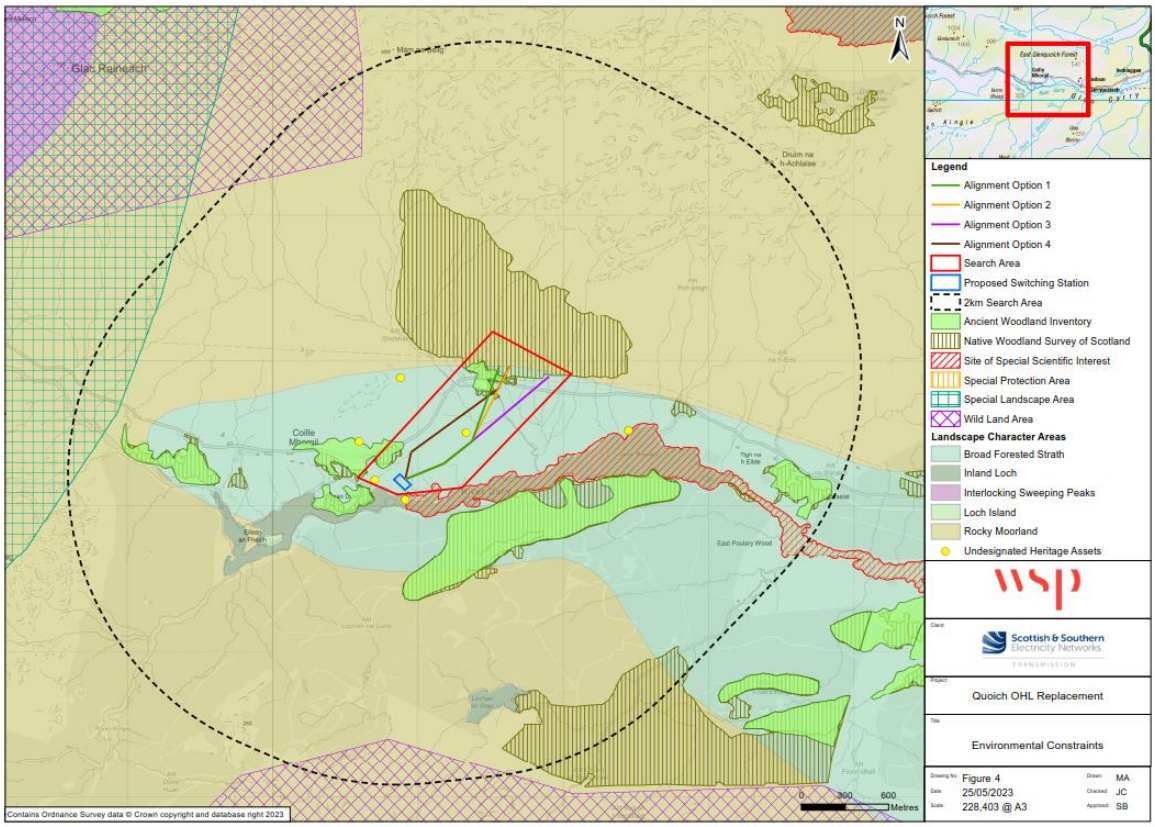

Figure 4 – Environmental Constraints

6.1.4 A summary of the key constraints for each option is detailed below:

Alignment Option A1

- Passes to the north of West Inverness-shire Lochs SPA at a distance of around 70 m with potential to disturb qualifying bird species during construction;
- Crosses an area of Ancient Woodland near to the existing Quoich Switching Station;
- Crosses an area on Annex 1 wet heath habitat;
- Located less than 700 m from residential receptors, and therefore they could be perceptible;
- Lies within an area popular for deer stalking and fishing; and
- Would involve a like for like tower line on the current alignment, posing engineering challenges for constructability and potentially prolonging outage planning.

Alignment Option A2

- Passes to the north of West Inverness-shire Lochs SPA at a distance of around 70 m with potential to disturb qualifying bird species during construction;
- Crosses an area on Annex 1 wet heath habitat and ancient woodland, although the Ancient Woodland can be avoided through micrositing;
- Located less than 700 m from residential receptors, and therefore they could be perceptible; and
- Is within an area popular for deer stalking and fishing.

Alignment Option A3

- Passes to the north of West Inverness-shire Lochs SPA at a distance of around 70 m with potential to disturb qualifying bird species during construction;
- Crosses an area on Annex 1 wet heath habitat, but avoids areas of Ancient Woodland;
- Located less than 700 m from residential receptors, and therefore they could be perceptible;
- Is within an area popular for deer stalking and fishing; and
- Would require additional towers and access tracks compared to the other alignment options causing more disturbance to the C1144.

Alignment Option A4

- Passes to the north of West Inverness-shire Lochs SPA at a distance of around 70 m with potential to disturb qualifying bird species during construction;
- Crosses an area on Annex 1 wet heath habitat, but avoids areas of Ancient Woodland;
- Located less than 700 m from residential receptors, and therefore they could be perceptible; and
- Is within an area popular for deer stalking and fishing.

7 Optimal Alignment

7.1 Environmental

7.1.1 From an environmental perspective, Alignment Option A3 would be marginally preferred, predominantly in terms of habitats, landscape character and planning policy. However, it should be noted that all Alignment Options are within close proximity to the SPA with potential significant effects on qualifying species and there is little to differentiate between them. Alignment Option A3 is marginally preferred as the associated risk of significant effects is slightly lower compared with Alignment Options A2 and A4, where ancient woodland is avoided through micrositing.

7.2 Engineering

7.2.1 From an engineering perspective Alignment Option A2 is preferred. All proposed options were similar in lengths, however, Option A3 has additional engineering challenges requiring an additional tower and it has to span over the existing line, avoiding the existing steel lattice assets. Additional towers would be required for Alignment Option A3 and more stone will be required. Alignment Option A1 would involve replacing a like-for-like tower line alongside the current alignment and this poses engineering challenges for constructability and potentially prolongs transmission outage.

7.3 Conclusion

7.3.1 When considering the Alignment Options alongside the required connections to and from each site, considering environmental, engineering and economic constraints, Alignment Option A2 is considered the overall Optimal Alignment as it reduces the engineering complexities associated with the Proposed Development whilst also offering opportunities to limit the overall environmental impacts to the wider area. The Optimal Alignment is shown in **Figure 5**.

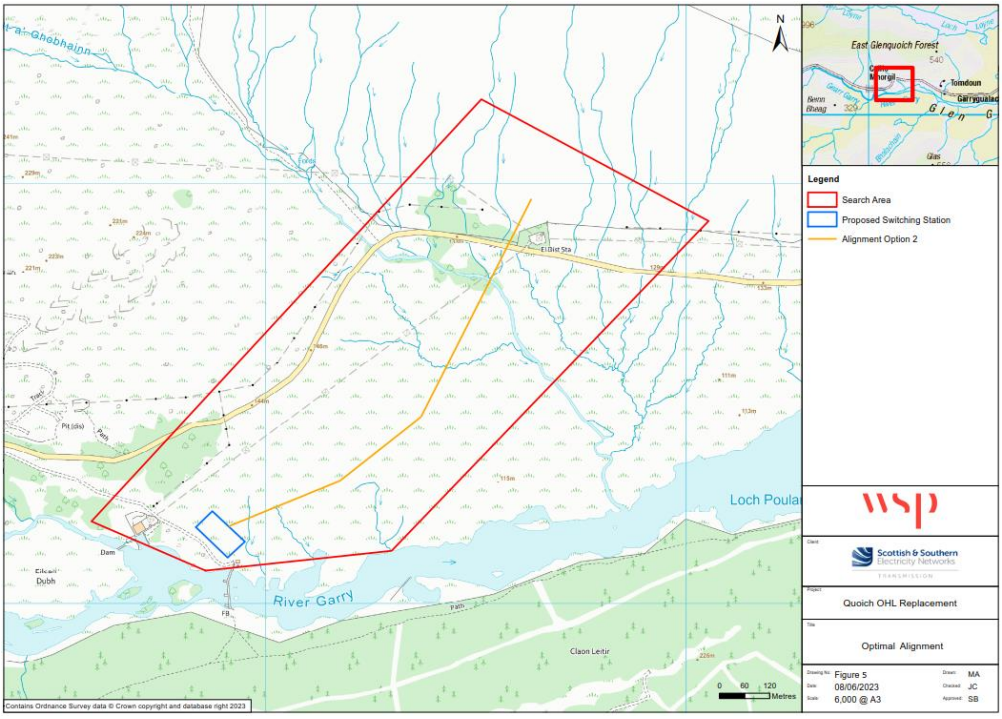

Figure 5 – Optimal Alignment Option

8 Next Steps

8.1.1 Following a period of consultation, for which comments on the Optimal Alignment are sought, a Report on Consultation and a Final Alignment Selection Study Report will be produced. The Report on Consultation will report on the consultation responses received from the publishing of the Consultation Document, identifying key issues and how they have been considered in finalisation of the indicative Proposed Alignment. It will confirm the indicative Proposed Alignment that will, where necessary, be taken to land rights and consenting processes, Section 37 application and Environmental Assessment. The Final Alignment Selection Study Report will describe the indicative Proposed Alignment, taking account of feedback from consultation and cross refer to the consultation process and Report on Consultation.

8.1.2 On completion of these documents the project will move to the next stage involving land rights and consenting processes, Section 37 application and Environmental Assessment. Further technical and environmental surveys will be undertaken to support this next stage of the project.