

Consultation Document –Fort Augustus Substation 400kV upgrade

November 2023

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Glossary

Term	Definition
Alternating Current (AC)	Type of electrical current in which the direction of flow of electrons switches back and forth at regular intervals or cycles.
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.
Distribution Network Operator (DNO)	A licensed company that owns and operates the network of cables, transformers and towers that provide electricity.
Gigawatt (GW)	A unit of electrical power equal to one billion watts.
High Voltage Direct Current (HVDC)	HVDC is an effective way to transmit electricity and is primarily transmitted in this form by overhead lines or underground cables.
Holistic Network Design (HND)	Detailed report identifying the electricity network needs to enable connection of 23GW of offshore wind, including the needs associated with the offshore and onshore transmission network, facilitating the UK government offshore wind target of 50 GW by 2030.
Kilovolt (kV)	A unit of electrical power equal to one thousand volts.
Kilowatt	A unit of electrical power equal to one thousand watts.
Local Development Plan (LDP)	LDP's are usually prepared by the Local Planning Authority and set out the proposals for future development and use of land in their area.
Megawatt (MW)	A unit of electrical power equal to one million watts.
National Planning Framework 4 (NPF4)	The national spatial strategy for Scotland. It sets out the spatial principles, regional priorities, national developments and national planning policy. It replaces NPF3 and Scottish Planning Policy.
Preferred Site	The Option that is the preferred choice, following Stage 2 – Detailed Site Selection based on environmental, engineering and cost perspectives.
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.
Volts	The international unit of electric potential and electromotive force.
Watts	The unit of measurement for the rate at which electrical energy is transferred or used.
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

This document has been prepared by Scottish and Southern Electricity Networks Transmission (SSEN Transmission). SSEN Transmission, operating under licence held by Scottish Hydro Electric Transmission plc (SHE Transmission), owns, operates and develops the high voltage electricity transmission system in the north of Scotland and remote islands. This document invites comments from all interested parties on the Proposed Site for an upgraded 400 kilovolt (kV) substation and associated infrastructure (hereafter referred to as the 'Proposed Development') required at Fort Augustus, approximately 1.6 km southwest of the town of Fort Augustus.

This document describes the site selection process followed, site options identified, the appraisal undertaken, the alternatives considered during the selection of options and the suggestion for a Proposed Site. This document supports the information made available to the public and statutory authorities as part of ongoing consultation. This Consultation Document along with project details is available online at the project website:

[Beauly Denny 400kV Upgrade - SSEN Transmission \(ssen-transmission.co.uk\)](https://ssen-transmission.co.uk)

In publishing this document, we aim to facilitate a more standardised format for the public and statutory consultees alike to access the information previously presented and one which enables a wide range of information about the project to be easily downloaded.

1.1 Project Background and Need

As a result of the Scottish and UK Governments' Net Zero climate change targets, together with requirements set out in the British Energy Security Strategy (BESS) (April 2022) and subsequently in National Grid's, the Electricity System Operator (ESO), "Pathway to 2030" Holistic Network Design (HND) (July 2022), significant increases in renewable generation capacity are required across the UK, resulting in significant investment in new transmission network infrastructure to transport this energy and reinforce the network.

The BESS sets out the UK Government's plans to secure the country's future energy independence by reducing the dependence on, and price exposure to, volatile global wholesale gas markets. This will be achieved by accelerating the deployment of homegrown and affordable low carbon electricity generation, together with accelerating the enabling electricity network infrastructure required to connect and transport this power. The BESS included an increased ambition for offshore wind generation of 50 gigawatt (GW) by 2030, up from the previous target of 40 GW.

To enable the connection of that 50 GW of offshore wind by the 2030 target date, the National Grid (the ESO), working in collaboration with the three Great Britain Transmission Owners, developed what is known as the 'Holistic Network Design' (the HND). This sets out the onshore and electricity transmission infrastructure required across Great Britain to deliver this UK Government target, including projects in SSEN Transmission's Licence Area across the north of Scotland.

Caithness and the surrounding area are home to some of Scotland's best wind resources and the existing electricity transmission network in the region is at full capacity, meaning the planned new renewable energy generation required by BESS cannot connect without significant network reinforcement.

As part of the wider UK network reinforcements detailed in the BESS and HND, SSEN Transmission is proposing to upgrade the existing Beauly-Denny 275 kV circuit to 400 kV to mirror the ratings of the existing 400 kV circuit which runs along the route. This upgrade can make use of the existing overhead line (OHL) infrastructure but requires alterations/additions to the associated substations along the route, namely at Beauly, Fasnakyle, Braco West, Tummel/Errochty/Kinardochy and Fort Augustus. Whilst the

project will be considered as one (with common timescales programmed) there are 5 distinct sites requiring works, each with differing scopes, requirements, and therefore consenting types and timescales. See **Figure 1** below.

In December 2022, the energy regulator, Ofgem, approved the need for these projects as part of its Accelerated Strategic Transmission Investment (ASTI) framework decision.

These projects, alongside several other major network upgrades planned in the north of Scotland, are therefore part of a Great Britain wide programme of works that are required to meet UK and Scottish Government energy targets; there is a clear expectation from Government and the energy regulatory, Ofgem, that these projects will be delivered by 2030. More specifically, these projects are needed to deliver Government 2030 renewable targets set out in the BESS.



Figure 1: Main North of Scotland Electricity Transmission Network in 2030.

1.2 Project Overview

SSEN Transmission is proposing to upgrade the existing Beauly-Denny 275kV circuit to 400kV to mirror the ratings of the existing 400kV circuit which runs along the route. The upgrade can make use of existing OHL infrastructure but requires alterations/additions to several associated substations including at Fort Augustus.

SSEN Transmission is therefore proposing an extension of the existing substation site at Fort Augustus to accommodate the additional equipment associated with the wider 400kV upgrade.

1.3 Strategic Considerations

Implementing the proposed development of the extension of the existing substation will comprise the following:

- Substation Platform Extension
- Upgrade of existing 275/132kV 240MVA transformers at Fort Augustus to 400/132kV 240MVA transformers;
- Four 400kV bays for interconnector circuits (two at existing busbar and two at new busbar);
- Two 400kV Reactors and associated switchgear bays;
- Two bus coupler bays and a bus section bay;
- Two bays for future generator connections;
- Further space provision for two future bays;
- Landscaping and biodiversity requirements;
- Palisade perimeter fence;
- Drainage works including alterations to existing SUDS pond and drainage system;
- UGC connections;
- Temporary construction compound; and
- Access improvements.

It should be noted that works to the overhead line, including the relocation (removal and new build) of the tower are works anticipated to be covered under the Overhead Lines (Exemption) (Scotland) Regulations 2013. A notification will be sent to the Local Planning Authority.

In addition to the Fort Augustus substation 400kV upgrade this planning application will also include the T&CP elements of the Coire Glas Pumped Storage Scheme Grid Connection (23/02874/S37) at the Fort Augustus Substation. The scope of works will include;

- Extension to the substation platform for the overhead line landing gantries
- Two new gantries and Air Insulated switchgear (AIS) bays
- The two circuits from the proposed Loch Lundie substation then connect into new bays within the existing 400kV Gas Insulated Switchgear (GIS) building.
- Underground the connections between the existing SGT5/6 and their respective GIS bays. These undergrounding works will be confined to the existing substation footprint.

1.4 Site Selection Process

A high-level options assessment has been undertaken proportionate to the nature and technical requirement of development being proposed. This process aligns with internal guidance to enable a consistent and rigorous selection of alignments and sites for new substations, switching stations and converter stations. The site selection process has three key stages, each increasing in detail and definition. Technical, environmental, and cost considerations are brought together in a way which seeks the best balance in accordance with SSEN Transmission’s Network Operator’s Licence and the Electricity Act 1989. This staged process leads to the identification of a finalised proposed substation site, which will be taken forward for planning. An overview of the Substation Site Selection Process is provided in **Figure 2**.

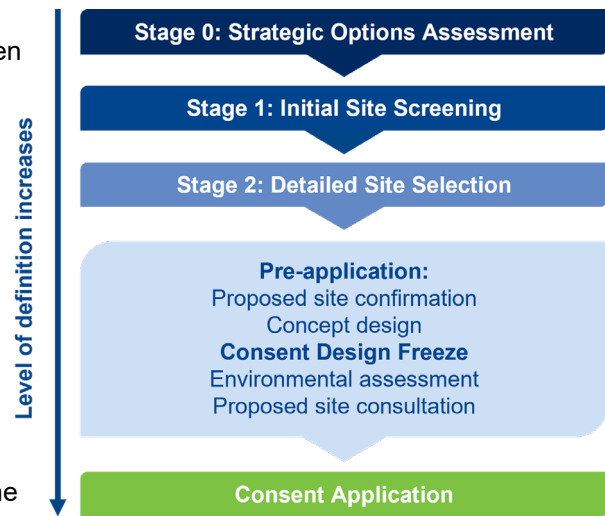


Figure 2: Overview of the Optioneering Process

Pre-Site Selection Activities: The starting point in all substation site selection projects is to establish the need for the project and to select potential engineering options that can deliver this need. This process will be triggered by the preparation of several internal assessments and documents.

Stage 1 Initial Site Screening: This stage seeks to identify technically feasible, economically viable and environmentally acceptable site options within a defined area. The search area may vary depending on terrain, other infrastructure, designated areas and features and connection options. The aim is to identify several potential sites which are initially assessed for suitability and to identify which of the identified sites can be shortlisted for further assessment.

Stage 2 Detailed Site Selection: This stage seeks to identify a potential substation site, which avoids where possible physical, environmental and amenity constraints, is likely to be acceptable to stakeholders and is economically viable, taking into account engineering and connection requirements.

2 Stage 1: Initial Site Screening

In this section the 5 potential Sites are presented (A to E), these have been evaluated in detail using a combination of multicriteria analysis and desktop study to identify options to progress to stage 2 analysis.

Assessment of the 5 Sites was undertaken against the key criteria within SSEN Transmission's internal site selection guidance and using the Red, Amber, Green (RAG) matrix which is provided as **Figure 3** below. This resulted in 4 of the 5 Sites being discounted from further assessment based on proximity to designated areas and local settlements, visual impact, ecological constraints, and connectivity to the existing and future infrastructure around Fort Augustus, when compared to the shortlisted Site. The following two pages show the location of each Site and the reasons why that Site was not taken forward to Stage 2.

Performance	Comparative Appraisal
Most preferred	Low potential for the development to be constrained.
↓	Intermediate potential for the development to be constrained.
Least preferred	High potential for the development to be constrained.

Figure 3: Overview of the RAG Matrix ratings

The following section highlights the location of each Site and the justification for selection of the Site for Stage 2 analysis.

Option A

- Option A is located approximately 550m south of the existing Fort Augustus substation, and approximately 1.58km southwest of the town of Fort Augustus.
- Option A is approximately 1.9km northwest of the Ness Woods SAC and Glen Tarff SSSI.
- Option A is located 230m northeast of an area of ancient woodland.
- Option A sits within a Drinking Water Protected Area for Groundwater and on a Low Productivity 2C Aquifer.
- Option A is located 70m northeast of the River Oich.
- Option A is located within a woodland conservancy area and within a large area of native pinewood.
- Option A located within the LCT 225/2019 which encompasses the Great Glen and Loch Ness.

Option B

- Option B is located approximately 3.48km southwest of the existing Fort Augustus substation, and approximately 5.37km from the town of Fort Augustus.
- Option B is approximately 4.9km west of the Ness Woods SAC and Glen Tarff SSSI.
- Option B is directly adjacent to and slightly within an area of ancient woodland in the south eastern border.
- Option B sits within a Drinking Water Protected Area for Groundwater and on a Low Productivity 2C Aquifer.
- No surface watercourses are present within Option B.
- Option B is located within a woodland conservancy area and on mixture of ancient woodland (of semi-natural origin) and plantation on ancient woodland site (PAWS).
- Option B is located within the LCT 225/2019 which encompasses the Great Glen and Loch Ness.
- Option B is located approximately 100m southwest of the Core Path IN16.10 (Bridge of Oich to Torr Dhuin).

Option C

- Option C is located approximately 2.39km southwest of existing Fort Augustus substation and approximately 4.4km southwest of the town of Fort Augustus.
- Option C is approximately 3.78km west of the Ness Woods SAC and Glen Tarff SSSI.
- Option C is entirely within an area of Ancient Woodland.
- Option C is located within a Drinking Water Protected Area for Groundwater and on a Unproductive 2C Aquifer.
- An unnamed surface watercourse flows directly through Option C, which flows into the Invergarry Burn. The Invergarry Burn is a tributary of the River Oich. The River Oich has a Good overall Water Framework Directive (WFD) status.
- Option C is found within a large area of native upland birchwood.
- Option B is located within the LCT 225/2019 which encompasses the Great Glen and Loch Ness.
- Core Path IN16.13 runs directly through Option C.

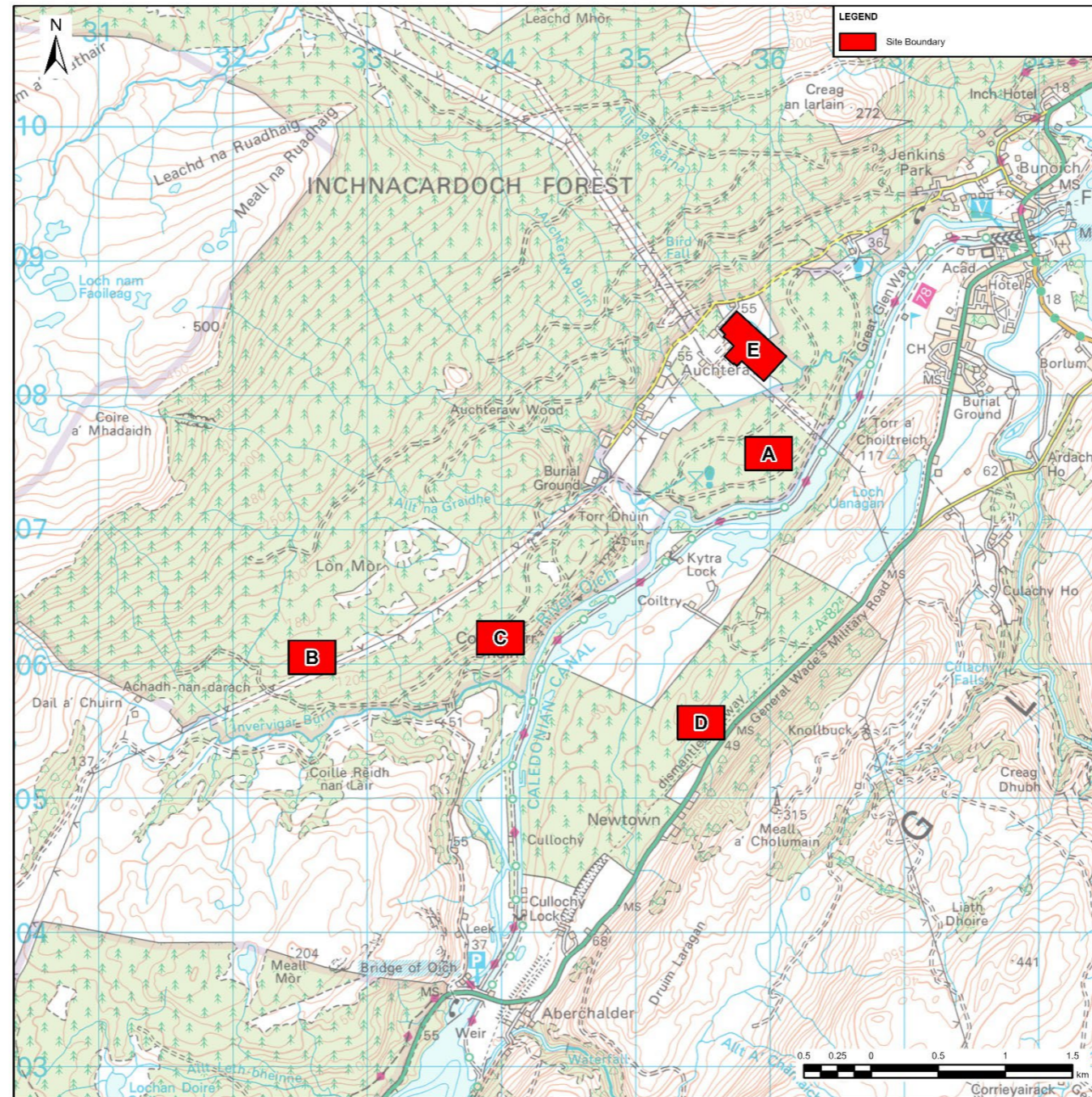


Figure 4. Options considered in Stage 1 - initial screening.

Option D

- Option D is located approximately 2.55km south of the existing Fort Augustus substation, and 3.41km from the town of Fort Augustus.
- Option D is approximately 4.9km west of the Ness Woods SAC and Glen Tarff SSSI.
- Option D is approximately 90m from the nearest area of Ancient Woodland.
- Option D is located within a Drinking Water Protected Area for Groundwater and on an Unproductive 2C Aquifer.
- One surface watercourse, the Alt Leirtir nan Lub, runs directly through Option D, this flows into the Invergarry Burn which is itself a tributary of the River Oich. The River Oich has a Good overall WFD status.
- The footprint of Option D is within an area of native woodland.
- Option D is located within LCT 225/2019 which encompasses the Great Glen and Loch Ness.
- Core Path (Caledonian Canal from Bridge of Oich to Fort Augustus) IN16.05 is approximately 600m northeast of Option D.

Site E

- Option E is situated on land adjacent to the existing Fort Augustus substation.
- Option E is located approximately 1.7km west of Fort Augustus.
- There is an existing access track to Option E via the unclassified road from Jenkins Park which leads from the A82.
- Option E is approximately 1.6km northwest of the Ness Woods Special Area of Conservation (SAC) and Glen Tarff Site of Special Scientific Interest (SSSI).
- Option E sits within a Drinking Water Protected Area for Groundwater and on a Low Productivity 2C Aquifer.
- Diversion of surface waters exists around the perimeter of Option E due to the existing Fort Augustus substation construction.
- Option E is located within Landscape Character Type (LCT) 225/2019, which encompasses the Great Glen and Loch Ness.
- Core Path (Auchteraw Woods path) IN16.14 is directly adjacent to the northern border of Option E.

3 Stage 2: Detailed Site Selection

The existing Fort Augustus Substation site was previously identified for substation reinforcement, with two upgrades developed for the site in two phases (18/00760/FUL). Phase One comprised works to install equipment including two additional 132kV /400kV transformers to allow for improved arrangements / connections for the Bhlraidh and Beinneun wind farms. These works were located primarily on the south-western boundaries of the existing substation and are now complete. Phase Two allowed for the interconnection of the 275kV bus-bar with the 400kV double bus-bar arrangements via two additional 400 / 275kV transformers. This solution would provide additional wider network benefits of interconnecting the 275kV and 400kV systems. These works were predominately on the north-eastern boundaries of the existing substation and have not commenced.

The option selection appraisal conducted in Stage 1, in line with the requirements outlined in Section 1.4, identified that substation Site E was recommended to be taken forward into the detailed assessment in Stage 2. The two options taken forward at Site E involve an AIS extension on the existing Fort Augustus substation (Option 1) and a GIS extension on the existing substation (Option 2). A summary outlining the findings of the detailed constraints assessment of each option is set out below.

Option 1 – AIS Extension

- Option 1 is constrained by two surface watercourses that pass through its footprint. A recently re-routed surface watercourse flows through the centre of Option 1. The Allt na Fearnna watercourse passes along the eastern boundary and flows southeast into the river Oich which has a Good overall Water Framework Directive rating. An unnamed watercourse also links Allt na Fearnna with the River Oich to the northeast of Option 1.
- Option 1 will require a greater volume of felling and larger loss of forestry compared with Option 2. Approximately 3.47ha of conifer plantation and native broadleaf exists within Option 1, the total area of which would likely require felling.
- The Core Path IN16.14 (Auchteraw Woods paths track) passes adjacent (~200m) to the northern border of Option 2.

Option 2 – GIS Extension

- The closest surface watercourse to Option 2 is the recently realigned surface watercourse, located 27m east of Option 2.
- No forestry exists within Option 2; however a small portion of conifer plantation and mixed broadleaf exists adjacent to the south eastern border of the option. Loss of this area may be required to facilitate construction.
- The Core Path IN16.14 (Auchteraw Woods paths track) passes adjacent (~200m) to the northern border of Option 2.

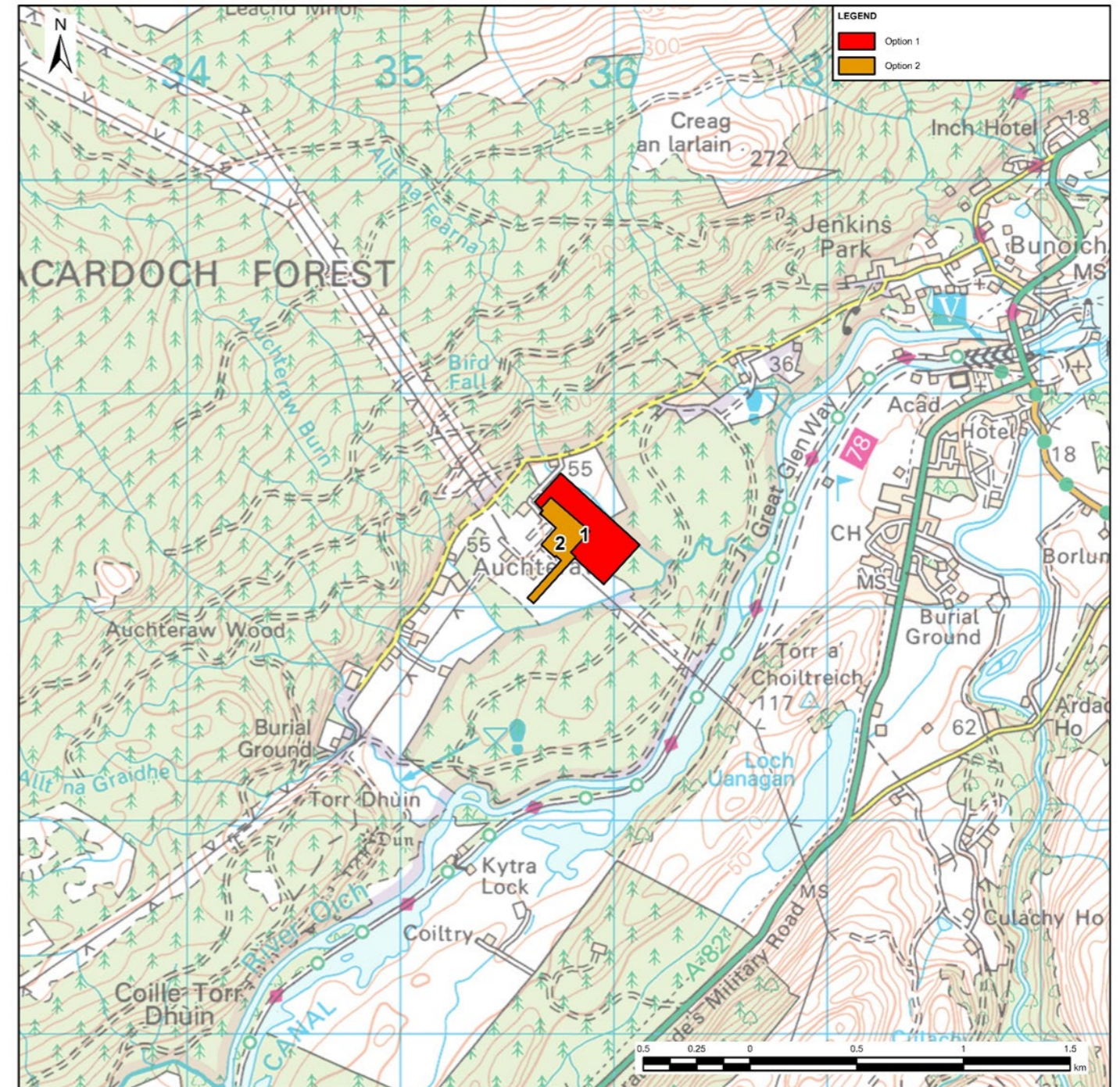


Figure 5: Options considered in Stage 2 – Detailed site screening.

Following the completion of the Stage 1 initial screening process, two Options at Site E were identified and taken forward to Stage 2. Environmental and engineering surveys have been undertaken for these options to supplement information gathered from desk-based assessments. The two options can be seen in Figure 5 on the previous page, summary details of the options are set out below:

- **Option 1:** A 400 kilovolt (kV) Air Insulated Switchgear busbar connecting into the existing Beauldy-Denny Overhead Line and 400kV busbar at Fort Augustus substation with a connection at a lower voltage back to the existing 132kV Fort Augustus AIS busbar Substation.
- **Option 2:** A 400 kilovolt (kV) Gas Insulated Switchgear busbar connecting into the existing Beauldy-Denny Overhead Line and 400kV busbar at Fort Augustus substation with a connection at a lower voltage back to the existing 132kV Fort Augustus AIS busbar Substation.

3.1 Connections Considerations

There are the following interconnectivity requirements with the existing infrastructure at Fort Augustus:

- Two 400kV circuits to existing busbar.
- 132kV cable circuits for SGT1 and 2 into the existing 132kV AIS.
- To prevent the interconnector circuits having to form part of the overall Beauldy-Denny line, one side should go through the existing busbar and one side via the new busbar.
- Connect to two 400kV Beauldy-Denny circuits.

The above connectivity constraints are relevant to both Option 1 and Option 2 and are demonstrated within the schematic in Figure 6.

These interconnectivity issues heavily favour a site extension as it minimises the impact of these factors. Within the land around the existing substation it would not be feasible to install an AIS design (Option 1) without major redevelopment of the floodwater drainage system and procurement of adjacent land to accommodate this. Option 1 also makes connecting future circuits very challenging on one side of the busbar.

The existing SSEN owned land at Fort Augustus has already been curated for another GIS busbar on the second Beauldy-Denny circuit currently operating at 275kV. By using this land it would be making the most of the works undertaken in the last several years to facilitate a new busbar at Fort Augustus. These previously completed works therefore favour Option 2.

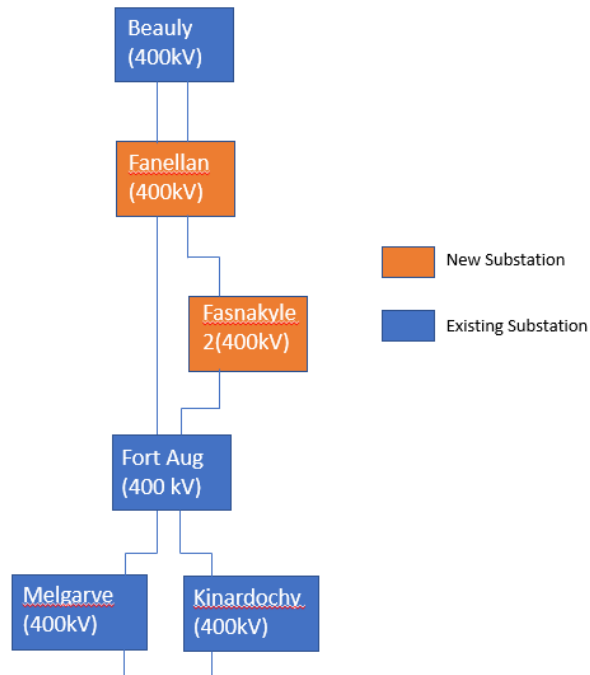


Figure 6: Proposed Network Schematic at Fort Augustus

3.2 Summary of RAGs

Table 1, Table 2 and Table 3 below provides a summary of the key differentiating factors between each of the screened Options regarding the key Engineering, Environmental and Cost criteria.

Table 1: Engineering Comparison of Shortlisted Options

Technology Option		Option 1 (AIS)	Option 2 (GIS)
Connectivity	Existing Circuits/Network	Due to large footprint of an AIS solution, some of the bays become difficult to access.	Existing circuits requiring bays on the new busbar are able to be connected in an optimal manner. There are challenges relating to the stage by stage implementation and maintaining sufficient live network throughout the works.
	Future Development Possibilities	Future bays on one side of the busbar would be inaccessible.	Future bays are accessible via cable connection from the south.
	Interface with SSE Distribution and Generation	Some existing distribution and generation circuits to be rerouted.	Some existing distribution and generation circuits to be rerouted.
	DNO Connection	N/A	N/A
Footprint requirements	Technology	Air Insulated switchgear requires a large footprint, not available at Fort Augustus without significant works	Gas insulated switchgear can utilise an area very similar to the previously consented 275kV arrangement.
	Adjacent Land Use	Would require relocation of flood mitigation watercourse and Biodiversity Net Gain planting.	Minimal impact on adjacent land.
	Space Availability	Space not available without significant works to relocate flood mitigation and Biodiversity Net Gain planting.	This arrangement can utilise the area between the flood mitigation watercourse and existing substation platform. Small extension to previous consent required.
Hazards	Unique Hazards	Proximity to flood mitigation watercourse. Glendoe and Distribution cabling requires rerouting.	Glendoe and Distribution cabling requires rerouting.
	Existing Utilities	Watercourse, Glendoe and Distribution cabling requires rerouting.	Glendoe and distribution cables require rerouting.
Ground Conditions	Topography	Due to the amount of space required for the AIS proposal there will be more civil works proposed for the final	The GIS site proposal has a smaller change in level from 41m AOD to 38m AOD over 200m length. This therefore

		<p>solution. The topography for the proposed AIS site is approx. 41m AOD at the Northwest of site and drops to approx. 37m AOD on the Northeast of the proposed site. This will require a stepped platform over 500m length. Or alternatively to accommodate the same level throughout there will be significant fill material on the Eastern edge. This site would also require a diversion of the previously installed flood alleviation scheme. Therefore, providing significantly more earthworks and greater risk of polluting the surrounding area during and after construction.</p>	<p>would require significantly less earthworks and avoid having to move the flood alleviation scheme.</p>
	Geology	<p>The site geology is situated on the great glen fault line. The superficial on site are considered as Glaciofluvial deposits which is consistent with recent Ground Investigation reports. The recent Ground Investigation reports consists of mainly sands and gravels throughout, previous boreholes close to the proposed site have been conducted over the years. Ground Investigation reports have confirmed that the rock beneath consists of West Highland Granite or Psammite. Rock Level is fairly consistent throughout the location of the site, Rock Level is approx. 1m – 3m below Ground.</p>	<p>The site geology is situated on the great glen fault line. The superficial on site are considered as Glaciofluvial deposits which is consistent with recent Ground Investigation reports. The recent Ground Investigation reports consists of mainly sands and gravels throughout, previous boreholes close to the proposed site have been conducted over the years. Ground Investigation reports have confirmed that the rock beneath consists of West Highland Granite or Psammite. Rock Level is fairly consistent throughout the location of the site, Rock Level is approx. 1m – 3m below Ground.</p>
Environmental Conditions	Elevation	40m above sea level	40m above sea level
	Salt Pollution	Inland Location (45km from coast)	Inland Location (45km from coast)

	Flooding	Flood mitigation would have to be relocated for this option to become feasible.	Flood mitigations were installed under previous works accounting for the area this option would utilise.
	Carbon Footprint	The larger platform, relocation of flood mitigation watercourse and associated ground disturbance would result in large carbon footprint during construction.	This option is on relatively made ground so the ground disturbance would be a lot less than a greenfield site. Carbon footprint would mostly be associated with gas leakage throughout the lifetime of the GIS and Gas-Insulated Busbars (GIB).
	SF6	Minimal levels of SF6 gas or other high Global Warming Potential (GWP) insulating gases.	Use of high volumes of non-SF6 insulating gas but this still carries GWP.
	Contaminated Land	Some of the construction is on recently established brownfield land.	Some of the construction is on recently established brownfield land.
	Noise (proximity to dwellings)	Some nearby noise receptors but based on noise modelling they should not be noise levels beyond statutory levels.	Some nearby noise receptors but based on noise modelling they should not be noise levels beyond statutory levels.
Construction Areas	Substation Access Road (from public road)	Existing substation access. Constrained in places but suitable for works.	Existing substation access. Constrained in places but suitable for works.
	Transformer Delivery Road	Constrained but this voltage and rating has been delivered to the substation in the recent past.	Constrained but this voltage and rating has been delivered to the substation in the recent past.
O&M	Access	AIS substations are much more open with singular equipment which is far easier to operate and maintain.	Gas-Insulated Busbars (GIB) is prone to leakage when exposed to weather. Seals are prone to breakdown which can lead to significant Maintenance costs. Compressed arrangement of GIS is more challenging to maintain.

Table 2: Environmental Comparison of shortlisted Options

<u>Environmental Comparison of Shortlisted Options</u>		<u>Option 1 – (AIS Extension)</u>	<u>Option 2 – (GIS Extension)</u>
Designations	International European or National Designations (e.g., SAC, SPA, RAMSAR National Parks, SSSI, Ancient Woodland).	Options 1 and 2 are approximately 1.6km and 2.08km from Ness Woods SAC / Glen Tarff SSSI respectively. Options 1 and 2 are approximately 260m and 500m west of an area of Ancient Woodland. As both options are unlikely to compromise the conservation status of designated features, they have both been assigned a green rating.	
	Regional designations (e.g., Local Nature Reserves, Wildlife Sites, RIGS)	A green rating was assigned to both options as no regional designations were identified within 5km of either option.	
Protected Species	European Protected Species (EPS)	There is a single building with bat roost suitability within the operational land of the site. Several species of bat recorded foraging / commuting, including Myotis species and brown long eared bat. Likely pine marten scats identified and habitat very suitable for this species. Red squirrel not recorded but likely present in suitable habitat. Both options have been assigned a green rating as although the presence of protected species within each option is likely, it is unlikely either option will compromise the conservation status of any of these protected species.	
	UK Biodiversity Action Plan (BAP) Species		
Habitats	Annex 1 Habitats	Small areas of we modified bog and wet heath were identified with Options 1 and 2. These areas were determined to be of low ecological value. Both options were assigned a green rating as they are unlikely to compromise the integrity of Annex 1 habitats.	
	Groundwater Dependant Terrestrial Ecosystems (GWDTE)	To be assessed at a later stage	

	Biodiversity (BNG)	To be assessed at a later stage
Ornithology	Schedule 1 Birds	Options 1 and 2 were assigned an amber rating as suitability for Crossbill breeding was noted though no evidence of the species was found during surveys.
	Birds of Conservation Concern (BoCC)	<p>The following Red List Birds of Conservation Concern (BoCC) were recorded through field survey of Options 1 and 2:</p> <ul style="list-style-type: none"> • Cuckoo • Mistle thrush • Lesser redpoll • Whinchat • Spotted flycatcher • House martin <p>Both options were assigned an amber rating due to the potential to compromise the conservation status of these species.</p>
Hydrology/Geology	SG Drinking Water Protected Areas (Over 10m ³ per day or supplies over 50 people)	Both options could compromise groundwater of regional importance as they are located within a Drinking Water Protected Area (Groundwater). As such, both options have been assigned an amber rating.
	Aquifer providing regional resources e.g., Abstractions for small public or private water supply. Hydrological supply to GWTDE	<p>Options 1 and 2 are located on a 2C classified aquifer, meaning there is potential for the options to compromise the quality and / or quantity of regionally important groundwater. Both options are located within 1km of private water supplies.</p> <p>Due to the potential for the options to compromise the quality and / or quantity of regionally important groundwater and private water supplies, they have been assigned an amber rating.</p>
	Surface waters	Two surface watercourses flow through Option 1; the Allt na Fearna on the eastern boundary and the realigned watercourse through the

		<p>centre of Option 1. The Allt na Fearnna feeds into the River Oich and the realigned watercourse feeds into the Auchertaw Burn.</p> <p>Option 2 is within 30m of a watercourse and is approximately 27m east of the realigned watercourse.</p> <p>Both options have been rated red for their potential to compromise these watercourses.</p>
Cultural Heritage	Designations (World Heritage Sites, Scheduled Monuments, Inventory Gardens, and Designed Landscapes, Inventory Battlefields)	There are no cultural heritage designations in close proximity to either of the options. Both options have therefore been assigned a green rating as there will likely be no direct impact to cultural heritage designations.
	Cultural heritage assets: Listed buildings, A, B & C Non-inventory GDL Conservation areas	There are no cultural heritage assets within close proximity to either of the options. Both options have therefore been assigned a green rating as there will likely be no direct impact to cultural heritage assets.
	Sites and Monument Record Entries	Forest Nurseries Township (109874) is located approximately 460m from Option 1 and 590m from Option 2. There are few SMR entries in the immediate area and this can be taken as an indication for low potential of previously unidentified archaeological / cultural heritage features. Therefore, Options 1 and 2 have been assigned a green rating.
Landscape and Visual	Landscape Character as defined in published charter assessments (e.g., SNH/NatureScot National Assessments)	<p>Options 1 and 2 are within the Landscape Character Type 225/2019 (broad steep-sided glen) as defined by the NatureScot Landscape Character Assessment 2019.</p> <p>Both options have been assigned an amber rating as they may compromise characteristic elements of LCT 225/2019.</p>
	Nation or Regional Designations: National Parks, National Scenic Areas, Inventory Gardens and Designed Landscape (GDL)	Loch Ness and Duntechaig Special Landscape Area (SLA) is approximately 2.2km east of Option 1 and 2.3km east of Option 2.

		Both options have been assigned an amber rating due to the proximity to the Loch Ness and Duntelchaig SLA which may compromise the special quality of the designated landscape.	
	Visual Settlements and residential properties, key transportation and recreational routes utilised by tourists and visitors to an area, vantage points and tourist destinations from where views and landscape appreciation is important.	<p>The following sensitive visual receptors have been identified in the vicinity of Options 1 and 2:</p> <ul style="list-style-type: none"> Residential / farmstead approximately 500m northeast of Option 1 and 700m of Option 2. Auchterawe House (holiday rental home) 830m west of Option 1 and 510m of Option 2. Area of residential settlement approximately 1.55km east of Option 1 and 1.25km of Option 2. Core Path (Auchteraw Woods paths) IN16.14 directly adjacent to the northern border of both options. <p>Both options have been assigned an amber rating as they may compromise the view or visual amenity from these locations.</p>	
Land use	Agriculture (National Scale Land Capability for Agriculture)	Options 1 and 2 are both classified as Class 4.2 (land capable of producing a narrow range of crops, primarily grassland with short arable breaks of forage crops) on the Scottish Government's Soils Maps. Both options have been assigned a green rating as they are not located on prime agricultural land.	
	Woodland	No woodland exists within Options 1 and 2 and therefore each option is assigned a green rating.	
	Commercial Forestry	3.47ha of conifer plantation and native broadleaf forestry exists in the south of Option 1. This volume of forestry will be lost due to tree-felling and clearing	No woodland or forestry exists within Option 2, but the option footprint is adjacent to an area of forestry consisting of plantation conifer and native broadleaf

		<p>activities to facilitate construction.</p> <p>Option 1 has therefore been assigned a red rating.</p>	<p>forestry. Small volumes of felling may be required around the south-eastern border of the option to facilitate construction.</p> <p>Option 2 has therefore been assigned an amber rating.</p>
Recreation	Public Footpaths, National Cycle Routes etc	<p>Core Path (Auchteraw Woods paths) is IN16.14 directly adjacent to the northern border of both options.</p> <p>Core Path (Jenkins Park Forest Walks) IN16.02 runs approximately 450 meters north of both options.</p> <p>National Cycle Network Route 78 is approximately 700m southeast of both options.</p> <p>Fort Augustus Golf Club is approximately 1km southeast of both options.</p> <p>As Options 1 and 2 are immediately adjacent to a Core Path, they may interact with the recreational amenity of the Core Path and have therefore been assigned an amber rating.</p>	
	Commercial Highland sports, fishing, stalking etc	<p>Public fishing is permitted for brown trout along the man-made portions of the Caledonian Canal.</p> <p>Both options will avoid interaction with this area and have therefore been assigned a green rating.</p>	
Planning	Policy: National/Regional/Local planning policy within the Local Development Plan	<p>The options would be considered National Development – Part 2 National Planning Policy, under the Strategic Renewable Electricity Generation and Transmission Infrastructure strategy. The following classes of development that are captured by the policy and are relevant to this proposed development are described below:</p> <p>b) New and/or replacement high voltage electricity lines and interconnectors of 132kv or more; and</p>	

		<p>c) New and/or upgraded infrastructure directly supporting high voltage electricity lines and interconnectors including converter stations, switching stations and substations.</p> <p>At a high level, there is national and local planning policy support for the principle of both options. Both options are located within close proximity to one another therefore the spatial designations and environmental constraints are similar across all options. At this stage and in the absence of detailed assessments and design mitigation, the proposals may conflict with a number of planning policies. As such, both options have been assigned an amber rating.</p>
	<p>Proposals: Existing information in the Planning Portal</p>	<p>Both options have been assigned an amber rating as there are third party development proposals within proximity of the options. As such, there is a risk of each of the options being inconsistent with other third-party proposals known to the planning system.</p>

Table 3: Cost Comparison of Shortlisted Options

Cost Topics	Option 1 (AIS)	Option 2 (GIS)
Capital	<p>An AIS extension would cost more due to the larger footprint. This increased size would result in additional land purchase, associated increase in civils works (including the realignment of the watercourse in the east), compensatory planting and BNG measures.</p> <p>The costs relating to any diversions or public road improvements would remain the same for both options.</p>	<p>A GIS extension would not incur additional land purchase, with the civils works footprint, felling and BNG costs being lower in comparison. The consenting costs would likely to be lower as there is a reduced risk in consent refusal with works being accommodated within the existing site footprint.</p>
Operational	<p>Costs for inspections and maintenance are similar for both AIS and GIS options, which includes costs associated with the equipment and any costs associated with the wider footprint of the substation boundary. Any cost difference is likely to be marginal.</p>	<p>Costs for inspections and maintenance are similar for both AIS and GIS options, which includes costs associated with the equipment and any costs associated with the wider footprint of the substation boundary. Any cost difference is likely to be marginal.</p>

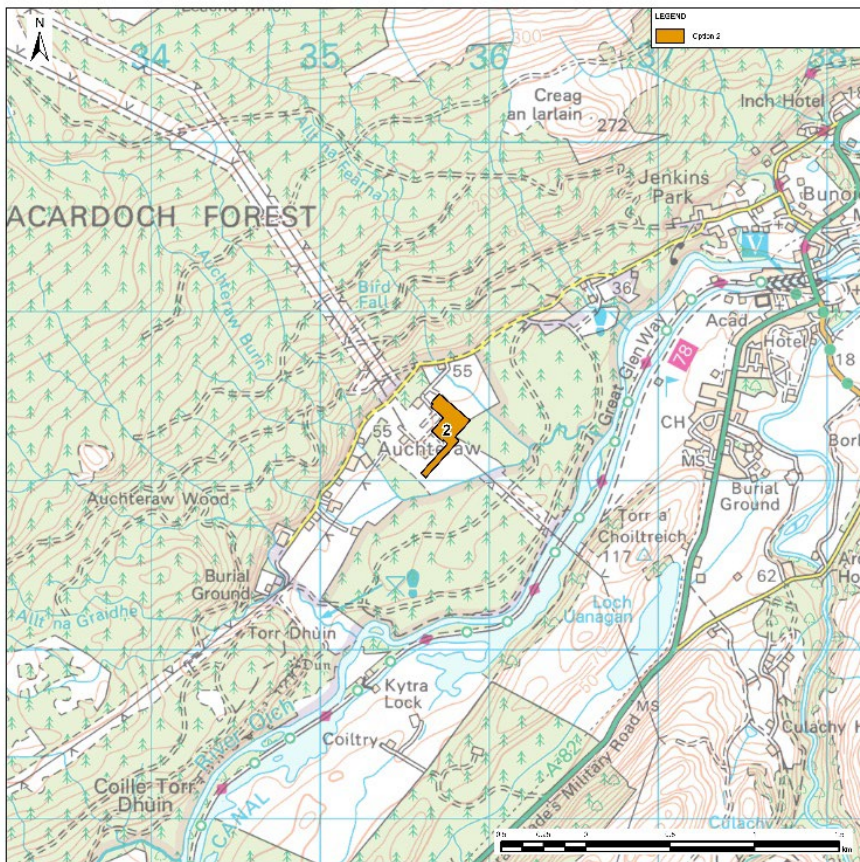
3.3 Summary of Comparative Assessment

3.3.1 Environmental

When considering the Stage 2 substation options in isolation based on the results of the detailed study and comparative analysis, it is recommended that from an environmental perspective Option 2 is the preferred development. The proximity of the options to each other means the results of the comparative assessment across most environmental criteria were similar. However, a preferred option is still recommended based on the following.

Option 1 will require a greater volume of felling and result in a greater loss of forestry compared to Option 2. Approximately 3.47ha of conifer plantation and native broadleaf forestry exist within Option 1, the total area of which would likely require felling. No forestry exists within Option 2, however a small portion of conifer plantation and mixed broadleaf forestry exists adjacent to the south eastern border and loss of this area may be required to facilitate construction. Nevertheless, Option 2 is more environmentally preferred in this regard.

Option 1 is also constrained by two surface watercourses that pass through its footprint; a recently realigned surface watercourse and the Allt na Fearna watercourse, which flows southeast into the River Oich. The River Oich has a Good overall Water Framework Directive status. The closest surface watercourse to Option 2 is the recently realigned surface watercourse which is approximately 27m east. Therefore Option 2 is more environmentally preferred in this regard.



A number of mitigation measures for the Phase Two development such as landscaping, and floodwater mitigation schemes have already been delivered on site and could be utilised as part of Option 2 development. Planning permission was previously secured for the development of a substation extension similar to what is currently being proposed for Option 2. Therefore Option 2 is more environmentally preferred in this regard.

Figure 7 Location of the preferred option - Option 2

3.3.2 Engineering

The two options were assessed on their ability to deliver the proposed scope of the project and the various criteria outlined within the RAG assessment in Table 1.

As both options assessed are site extensions, within roughly the same land, the pertinent issues are relating to footprint, impact on existing infrastructure and connectivity of existing and future circuits. On all the above criteria Option 2 is the preferred solution.

Option 1 would require a significantly larger footprint due to the AIS technology. Option 1 also requires the relocation of the recently installed flood mitigation measures at Fort Augustus substation. These would have to be reconstructed in adjacent land and require further land purchase. Option 1 also causes issues with connectivity to the existing substation. There are various connectivity issues with the AIS option due to the larger footprint consuming the space that would be available for making circuit connections.

These key factors are alleviated via the use of gas insulated switchgear within Option 2. The footprint is reduced and can be accommodated within the space between the existing compound and the floodwater mitigation infrastructure. Connecting to the existing substation is challenging and requires complex construction phasing but is feasible. Future connections into the new 400kV busbar would again be challenging but is feasible if connected via underground cable.

3.3.3 Cost

The approximate construction cost of the substation site options has been calculated based on standard rates derived from SSEN Transmission's experience of similar projects.

From a cost perspective, the construction costs of all substation site options are considered to be higher for Option 1 (AIS) than Option 2 (GIS). This is because there is a larger footprint requirement, which would involve additional purchase of land which cannot be accommodated within the current site boundary. As a result there are additional costs associated with increased civils works, the realignment of the watercourse as well as increased compensatory planting and BNG measures.

In terms of cost for the operation and maintenance of the Substation both Site Options are considered to be similar, as the design for each option would be broadly similar and are geographically close enough that the same environmental conditions will be encountered, and therefore maintenance requirements are likely to be similar.

The cost impact rating summary is provided in Table 3.

3.3.4 Conclusion

Option 2 is preferred for environmental, engineering and cost factors for the reasons set out in this consultation document. As such, Option 2 is the overall proposed option as shown on **Figure 7**.

4 Next Steps

Two sequential, public consultation events will follow the submission of the Proposal of Application Notice (PAN), which was submitted on the 30th October 2023. The PAN submission triggers the initial formal Town and Country Planning (major application), consultation process for this site - including the 12-week (minimum) pre-application consultation period.

The first consultation is planned for Thursday 30th November 2023 from 2pm-7pm at the Fort Augustus Village Hall, Church Road, Fort Augustus, PH32 4DG. The responses received from the consultation event, and those sought from statutory consultees and other key stakeholders will inform further consideration of the proposal.

The second consultation event is planned for February 2024 to advise on the finalised design and provide feedback on responses received and alterations as a result of feedback from this initial consultation event. This will be prior to the main planning application submission.

A Pre-Application Consultation (PAC) report which summarises the results of the consultation events will be submitted to The Highland Council with the planning application.

The outcome will be a planning application for consent under the Town & Country Planning (Scotland) Act 1997 (as amended) 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 e.g. SuDS and key electrical features, such as transformers.

The application may 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 would be carried out to support the application.

The moving of a single overhead line tower is covered under the Overhead Lines (Exemption) (Scotland) Regulations 2013. A notification will be sent to The Highland Council.