MSIP Re-opener Application Stage 1– SPT-RI 173 Glenglass to Glenmuckloch 132kV OHL		
Ofgem Scheme Reference/ Name of Scheme	SPT200324 / SPT-RI 173 Glenglass to Glenmuckloch 132kV OHL	
Investment Category	Local Enabling (Entry)	
Primary Investment Driver	Connection of customer-driven onshore renewable generation	
Licence Mechanism/ Activity	Special Condition 3.14 Medium Sized Investment Projects Re-opener and Price Control Deliverable/ Clause 3.14.6 (a)	
Materiality Threshold exceeded (£3.5m)	Yes, as a single project due to the threshold for activity 3.14.6 (a)	
PCD primary Output	Generation: (MW)	
Total Project Cost (£m)	35.279m	
Funding Allowance (£m)	To be confirmed	Requested
Delivery Year	2027/28	
Reporting Table	Annual RRP – PCD Table	
PCD Modification Process	Special Condition 3.14, Appendix 1	

Issue Date	Issue No	Amendment Details
31st January 2024	1	First issue of document.

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Table of Contents

1. Abbreviations / Terminology

Table 1: Table of Abbreviations

Abbreviation	Term
ACM	Asbestos Containing Material
AIS	Air Insulated Switchgear
BEIS	Department for Business, Energy & Industrial Strategy
CDM	Construction Design and Management
CEC	Connection Entry Capacity
CION	Connection and Infrastructure Options Note
CT	Current Transformer
GIS	Gas Insulated Switchgear
GSP	Grid Supply Point
ITT	Invitation to Tender
Km	Kilometre
kV	Kilovolt
LC	Licence Condition
LSpC	Licence Special Condition
MSIP	Medium Sized Investment Project
MW	Megawatt
NETS SQSS	National Electricity Transmission System Security and Quality of Supply Standard
NGET	National Grid Electricity Transmission
NGESO	National Grid Electricity System Operator
NOA	Network Options Assessment
OHL	Overhead Line
PCD	Price Control Deliverable
RIIO	Revenue = Incentives + Innovation + Outputs
SCADA	Supervisory Control and Data Acquisition
SGT	Supergrid Transformer
SHET	Scottish Hydro Electric Transmission
SPT	SP Transmission
SPEN	SP Energy Networks
STC	System Operator – Transmission Owner Code
VDUM	Volume Driver Uncertainty Mechanism
VT	Voltage Transformer

2. Reference Documents

Table 2: Table of Reference Documents

Document Reference	Title
SPEN-RIIO-T2_Business_Plan	SP Energy Networks RIIO T2 Business Plan 2021 - 2026
RIIO-T2 MSIP Re-opener Application	SPT-RI-302 – Glenglass 132kV Substation
Environmental Impact Assessment	EIA - Glenmuckloch to Glenglass Reinforcement Project

3. Introduction

This MSIP Re-opener application sets out SPT's plans to carry out reinforcement work between Glenglass 132kV Substation and a new Glenmuckloch 132kV Substation within the RIIO-T2 and early RIIO-T3 periods. These works, described in Transmission Owner Reinforcement Instruction SPT-RI-173, will extend the 132kV transmission network in southwest Scotland from Glenglass 132kV Substation to a new Glenmuckloch 132kV Substation, enabling the connection of the consented 132MW Lethans Wind Farm and 210MW Glenmuckloch Pumped Storage hydro scheme.

The works comprise of the following:

- Provision of two Gas Insulated Switchgear (GIS) feeder bays for the new Glenmuckloch No.1 and No.2 circuits at Glenglass 132kV Substation[1];
- Construction of a new double circuit 132kV Overhead Line (OHL), with approximate 9.3km route length, between Glenglass 132kV Substation and Glenmuckloch 132kV Substation; and
- The establishment of a 132kV double busbar Air Insulated Switchgear (AIS) substation at Glenmuckloch, to accommodate up to 11 bays initially and designed for the future establishment of a local 400kV Substation.

As well as enabling the connection of the 342MW of consented generation noted above, these works will also facilitate the future extension of the transmission network from Glenmuckloch to the planned Redshaw 400kV Substation (ref. SPT-RI-236), enabling the connection of a further 650MW of contracted renewable generation capacity in southwest Scotland. Redshaw 400kV Substation (ref. SPT-RI-2060) will connect to the Strathaven – Harker 400kV (ZV) overhead line route between Coalburn and Elvanfoot 400kV Substations.

This MSIP Re-opener application is submitted in accordance with Licence Special Condition (LSpC) 3.14.6 and relates specifically to LSpC 3.14.6 activity (a):

"3.14.6 The licensee may apply to the Authority for a direction amending the outputs, delivery dates or associated allowances in Appendix1 in relation to one or more of the following activities:

(a) a Generation Connection project, including all infrastructure related to that project, the forecast costs of which are at least £4.24m more or less than the level that could be provided for under Special Condition 3.11 (Generation Connections volume driver)"

Applying the RIIO-T2 Generation Connections Volume Driver Uncertainty Mechanism (VDUM) to this project results in the £35.279m estimated total project cost being £22.414m higher than the £12.865m allowance provided by the VDUM. An MSIP Re-opener application is therefore required.

The needs case for SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL and the factors that have an impact on the timing and scope of works are discussed in the following sections. Full justification for the preferred investment option is presented, together with a detailed description of the proposed solution.

[1] These works are aligned with the planned development of a new 132kV double busbar substation, utilising gas insulated switchgear, at Glenglass (ref. SPT-RI-302). SPT's Stage 1 MSIP Re-opener application submission of January 2023 in respect of SPT-RI-302 described in detail the background and needs case for the Glenglass works. Both the needs case and proposed works were supported by Ofgem in its provisional decision published on 20th September 2023.

The estimated total project cost may be subject to change. As agreed with Ofgem, a second stage MSIP submission will be made at the right time relating to the associated amendments to outputs, delivery dates and allowances to be detailed as Price Control Deliverables (PCDs) in LSpC 3.14 Appendix 1.

3.1. Structure of Document

This MSIP Re-opener application is structured as follows:

Section 4 – Background and Needs Case

This section outlines the background to the proposed works and details the key project drivers.

Section 5 – Assessment of Options

This section sets out the approach taken to considering the distinct options available to address the need identified in Section 4. The results of an evaluation of the alternative options are presented and the reasoning behind the selection of the preferred investment option is summarised.

Section 6 – Proposed Works

This section provides a description of the proposed solution. It sets out the project scope and other key supporting information.

Section 7 – Project Cost Estimate

This section summarises the estimated cost of the selected option.

Section 8 – Project Delivery

This section outlines the approach which will be taken to deliver the project.

Section 9 – Conclusions and Recommendations

This section summarises the conclusions and includes recommendations to be taken.

3.2. Requirements Mapping Table

Table 3 maps the requirements set out within Chapter 3 of the Re-opener Guidance and Application Requirements Document[2] against specific sections within this document.

Table 3: Requirements Mapping Table

Section	Description	Relevant Section(s) in Re-opener Guidance and Application Requirements Document
3	Introduction	3.3, 3.4
4	Background and Needs Case	3.8, 3.9, 3.10, 3.11
5	Assessment of Options	3.13, 3.14, 3.21, 3.22
6	Proposed Works	3.14
7	Project Cost Estimate	3.12, 3.19, 3.20
8	Project Delivery	3.15, 3.16, 3.17

[2] Re-opener Guidance and Application Requirements Document: Version 3

4. Background and Needs Case

4.1. Statutory and Licence Obligations on SP Transmission plc

SP Transmission plc (SPT) is licenced under section 6(1)(b) of the Electricity Act 1989 ("the 1989 Act") to transmit electricity. The licence is granted subject to certain standard and special conditions. Under section 9(2) of the 1989 Act, SPT is required to fulfil the following duty: -

- *To develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and*
- *To facilitate competition in the supply and generation of electricity.*

This statutory duty is reflected in SPT's transmission licence. In addition, SPT has the following obligations pursuant to its licence conditions (LCs): -

- To at all times have in force a System Operator-Transmission Owner Code (STC) which, amongst other things, provides for the co-ordination of the planning of the transmission system (LC B12);
- To at all times plan and develop its transmission system in accordance with the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS) and in so doing take account of National Grid Electricity System Operator's (NGESO's) obligations to co-ordinate and direct the flow of electricity on, to and over the GB transmission system (LC D3);
- To make available those parts of its transmission system which are intended for the purposes of conveying, or affecting the flow of, electricity so that such parts are capable of doing so and are fit for those purposes (LC D2); and
- To offer to enter into an agreement with the system operator on notification of receipt of an application for connection, or for modification to an existing connection (LC D4A).

Section 38 and Schedule 9 of the 1989 Act also impose duties on SPT when formulating any relevant proposals. In response to statutory and licence obligations upon it, SPT therefore requires to ensure that the transmission system is developed and maintained in an economic, co-ordinated and efficient manner, in the interests of existing and future electricity consumers, balancing technical, economic and environmental factors.

4.2 Key Project Drivers

In June 2019, the UK parliament passed legislation introducing a binding target to reach net zero greenhouse gas emissions by 2050. In Scotland, the Scottish Parliament has committed Scotland to becoming a net-zero society by 2045. The timely connection of low carbon generation, such as onshore wind, will play a vital role in reaching these legislated net zero targets. Further commitments, by the UK Government in October 2021, to decarbonise the power system by 2035, further support the requirement for investment in the existing electricity transmission system to enable the timely connection and integration of the required renewable generation sources. In December 2022 the Scottish Government published its Onshore Wind Policy Statement[3], setting out its ambition to deploy 20GW of onshore wind capacity by 2030.

On 9th September 2021, the former Department for Business, Energy & Industrial Strategy (BEIS) announced a £265m[4] budget per year for the Contracts for Difference (CfD) Allocation Round 4, which launched on 13th December 2021 and concluded on 7th July 2022. For the first time since 2015,

[3] Onshore wind: policy statement 2022 - gov.scot (www.gov.scot)
[4] Biggest ever renewable energy support scheme backed by additional £265 million - GOV.UK (www.gov.uk)

established technologies, including onshore wind, were able to bid. Given lowering technology costs and a favourable subsidy regime, this will support a considerable number of onshore renewables projects to successfully transition from project inception and development through to energisation[5]. The results of the CfD Allocation Round 5 were announced on 8th September 2023, with annual auction rounds expected thereafter.

4.3 SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL - Background

Glenglass 132kV Substation forms part of the SPT network in southwest Scotland, situated to the east of New Cumnock 275/132kV substation.

A geographic overview of the existing SPT system is provided in Appendix A. Figure 1 below shows an extract from this geographic overview, indicating existing transmission network connectivity in proximity to Glenglass 132kV Substation and a representation of the proposed location for the Glenmuckloch 132kV Substation that will be established as part of this project.

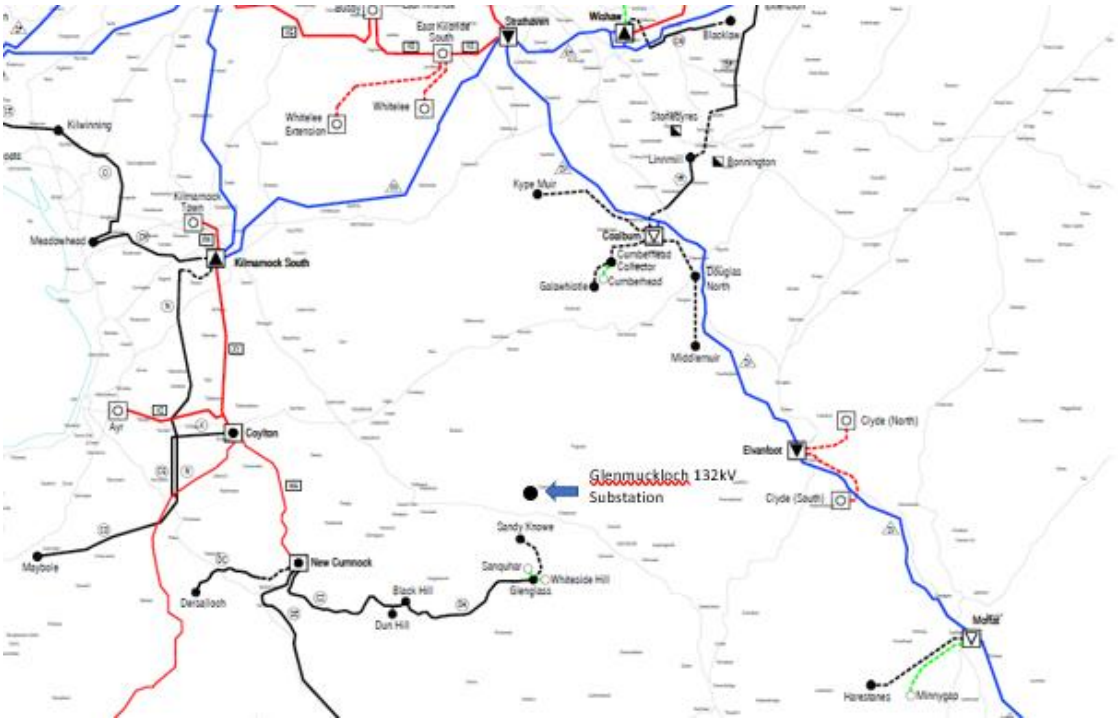

Figure 1: Geographic Indication of the Glenglass and Glenmuckloch 132kV Substations

The Glenglass to Glenmuckloch 132kV OHL project has been developed to allow the extension of the southwest Scotland 132kV network from Glenglass to the new Glenmuckloch substation to enable the connection of the consented Lethans Wind Farm, Glenmuckloch Pumped Storage hydro scheme. It will also facilitate connection of further renewable generation developments in southwest Scotland.

A Bilateral Connection Agreement is in place between NGESO and the developers of the generation projects detailed in Table 4 below. In each case, the SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project is identified as Enabling Works, either independently (ref. Table 4 Column 5), or in combination with SPT-RI-236 and SPT-RI-2060 (ref. Table 4 Column 6). Corresponding Transmission Owner Construction Agreements are in place between NGESO and SPT.

[5] BEIS Electricity Generation Costs (2020) - GOV.UK (www.gov.uk)

Table 4: Contracted Generation Dependent Upon SPT-RI-173

Connecting Substation	Contracted Development	Consent Status	Contracted Energisation Date	SPT-RI-173	SPT-RI-173, SPT-RI-236 & SPT-RI-2060
Glenmuckloch 132kV Substation	Glenmuckloch Hydro Pumped Storage	Consented	Jun. 2027	Enables Connection – 210MW	N/A
	Lethans Wind Farm	Consented	Jun. 2027	Enables Connection – 132MW	Facilitates change in access (RAA[6] to Non-Firm[7])
	Lethans Wind Farm Extension	Application	Oct. 2027	-	Enables Connection – 85MW
	Hare Hill Repowering Wind Farm	Pre-Application	Oct. 2029	-	Enables Connection – 114MW
Glenglass 132kV Substation	Sandy Knowe Wind Farm	Connected	Oct. 2027 for TEC increase.	-	Enables TEC increase: 86.4MW to 108MW
	Windy Rig Wind Farm	Connected	-	-	Facilitates change in access (RAA to Non-Firm)
	Sanquhar II Wind Farm	Consented	Apr. 2026	-	Facilitates change in access (RAA to Non-Firm)
	Glenmuckloch Wind Farm	Consented	Oct. 2026	-	Facilitates change in access (RAA to Non-Firm)
	Cloud Hill Wind Farm *	Application	Sept. 2028	-	Enables Connection – 50MW
	Lorg Extension Wind Farm *	Pre-Application	Aug. 2029.	-	Enables Connection – 33MW
	Rowancraig Wind Farm *	Pre-Application	Oct. 2028	-	Enables Connection – 40MW
	Airds Hill Wind Farm *	Pre-Application	May 2031	-	Enables Connection – 80MW
New Cumnock 132kV Substation	Dersalloch Wind Farm & BESS *	Consented	Oct. 2027 for TEC increase.	-	Enables TEC increase: 69MW to 80MW
	Windy Standard III Wind Farm*	Consented	Jun. 2029 for final TEC increase.	-	Enables TEC increase: 42MW to 96MW
	Breezy Hill Wind Farm *	Pre-Application	Apr. 2028	-	Enables Connection – 80MW
	South Kyle II Wind Farm *	Pre-Application	May 2029	-	Enables Connection – 81MW
Total Capacity (MW)		-	-	**342MW**	**650MW**

* Connections to Glenglass and New Cumnock enabled by virtue of the commissioning of the Glenmuckloch to Redshaw connection offloading the New Cumnock 275/132kV Super Grid Transformers (SGT's).

[6] Restricted Available Access (RAA) - When the transmission network is intact, network conditions may be such that the network becomes overloaded, requiring generation to be disconnected. Available on an interim basis only for developments with planning permission.

[7] Non-Firm - For an intact transmission network, no overloading may occur and thus generation will not be disconnected. Following a single transmission circuit outage (planned or unplanned), generation will be disconnected if overloading of the transmission network results. This will be dependent upon the particular network conditions (e.g. maximum generation and minimum load).

During the process of identifying and evaluating options for each connection offer, due regard was given to the development of an efficient, co-ordinated and economical system of electricity transmission. As well as determining the most appropriate connection location, the most appropriate method of connection (e.g. overhead line, underground cable, wood pole vs. steel tower, connection voltage etc.) was also considered.

4.4 Glenmuckloch 132kV Substation - Planned Renewable Generation Capacity

SPT has entered into TO Construction Agreements (TOCAs) with NGESO to connect several renewable generation development sites in the Sanquhar area to the future Glenmuckloch 132kV Substation. The connection of these renewable generation sites will be contingent upon the works described in Section 6 – Proposed Works being completed. The list of renewable generation sites is listed below;

- Glenmuckloch Hydro Pumped Storage (SPT-TOCO-312);
- Lethans Wind Farm (SPT-TOCO-206);
- Lethans Wind Farm Extension (SPT-TOCO-2604);
- Hare Hill Repowering (SPT-TOCO-2786).

4.4.1 Direct Connections to Glenmuckloch 132kV Substation

A total of 324MW of generation capacity is contracted to connect directly to Glenmuckloch at 132kV. This generation is summarised in Table 5 below:

Table 5: Contracted Generation - Directly Connected to Glenmuckloch 132kV Substation

Site	Connection Status	Consent Status	Capacity (MW)	Contracted Energisation Date
Glenmuckloch Pumped Storage	Contracted	Consented	210	Jun. 2027
Hare Hill Repowering	Contracted	Pre-Application	114	Oct. 2027
Total Contracted Capacity (MW)			**324**	

Glenmuckloch Pumped Storage:

Glenmuckloch Pumped Storage is planned to connect directly into the proposed Glenmuckloch 132kV AIS substation. It is contracted to connect by June 2027 and will represent 210MW additional generation capacity. This connection is customer funded in accordance with SPT-TOCO-312.

Hare Hill Repowering:

Hare Hill Repowering is planned to connect directly into the proposed Glenmuckloch 132kV AIS Substation via a new 132kV circuit between Glenmuckloch 132kV Substation and the User's site. At the User's site a 132/33kV 120MVA transformer shall be installed along with a 33kV circuit breaker to provide the Point of Connection. It is contracted to connect by October 2027 and will represent 114MW additional capacity. Note that Hare Hill Repowering is contingent on SPT-RI-236 as well as SPT-RI-173.

4.4.2 Connections to Glenmuckloch 132kV Substation via SPT-RI-2792

A total of 297MW of renewable generation is contracted to connect to Glenmuckloch 132kV substation via the completion of SPT-RI-2792 - Glenmuckloch to Lethans Collector 132kV circuit. This generation is summarised in Table 6 below:

Table 6: Contracted Generation - Connected to Glenmuckloch 132kV Substation via SPT-RI-2792

Site	Connection Status	Consent Status	Capacity (MW)	Contracted Energisation Date
Lethans Wind Farm	Contracted	Consented	132	Jun. 2027
Lethans Wind Farm Extension	Contracted	Application	85	Oct. 2027
Airds Hill Wind Farm	Contracted	Pre-application	80	May 2031
Total Contracted Capacity (MW)			**297**	

Glenmuckloch to Lethans Collector 132kV circuit:

The Glenmuckloch to Lethans Collector 132kV circuit is planned to connect directly into the proposed Glenmuckloch 132kV AIS substation. It is planned to complete by June 2027 and will enable 297MW additional generation capacity. This connection is funded in accordance with SPT-RI-2792.

Lethans Wind Farm:

Lethans Wind Farm is planned to connect directly into the proposed Lethans 132kV Collector Substation. It is contracted and planned to connect by October 2027 and will represent 132MW additional generation capacity. This connection is customer funded in accordance with SPT-TOCO-490.

Lethans Wind Farm Extension:

Lethans Wind Farm Extension is planned to connect directly into the proposed Lethans 132kV Collector substation. It is contracted and anticipated to connect by October 2027 and will represent 85MW additional generation capacity. This connection is customer funded in accordance with SPT-TOCO-2604. Note that Lethans Wind Farm Extension is contingent on SPT-RI-236 as well as SPT-RI-173 and SPT-RI-2792.

Airds Hill Wind Farm:

Airds Hill Wind Farm is also planned to connect directly into the proposed Lethans 132kV Collector substation under SPT-RI-2792. It is contracted and anticipated to connect by May 2031 and will represent 80MW additional generation capacity. This connection is customer funded in accordance with SPT-TOCO-3111. Note that Airds Hill Wind Farm is contingent on SPT-RI-236 as well as SPT-RI-173 and SPT-RI-2792.

4.5 Alignment with RIIO-T2 Strategic Goals

As described in our RIIO-T2 plan[8] for the five-years to the end of March 2026, to mitigate the impacts of climate change and achieve a low-carbon energy system requires a level of focused effort and commitment never seen before. The mass electrification of transport and heat has only started and there is a huge amount required to build on the timely progress already made in the electricity sector.

[8] SP Energy Networks RIIO-T2 Business Plan

Energy networks are critical to achieving the wider Net Zero emissions targets and with continued engagement with consumers, network users and our wider stakeholders, we've set a progressive plan in place to facilitate a Net Zero future. Our RIIO-T2 plan sets out four strategic goals – informed by our stakeholder priorities – that will keep us moving towards this sustainable future. These goals and their alignment with SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project, are summarised in Figure 2 below.

Further detail regarding how this proposal aligns to our four Strategic Goals is outlined below:

Take a leading role in delivering a Net Zero future that is consistent with government objectives.

By investing in a new AIS double busbar at Glenmuckloch 132kV Substation, a two bay extension to the GIS double busbar at Glenglass 132kV Substation and the establishment of circa 9.3km 132kV L7 double circuit OHL between Glenglass and Glenmuckloch 132kV Substations, it will enable the connection of an additional 342MW of contracted renewable generation capacity in the surrounding area. This will alleviate the need to constrain the renewable generation sources and will contribute towards a reduced reliance on fossil fuel electricity generation sources. It will also enable the connection of a further 650MW upon completion of other works (ref. SPT-RI-236 and SPT-RI-2060).

Deliver the benefits of increased cost-efficiency to network users and consumers by continually innovating and applying whole system solutions.

Following receipt of applications for connection, SPT has worked with NGESO throughout the connection offers process to issue connection offers which reflect the most cost-effective connection solutions on a whole systems basis, compliant with the relevant technical standards.

During the Optioneering phase of this project multiple solutions were assessed to establish the most cost-effective engineering solution. More information can be found in Section 5.

Maintain world-leading resilience and system operability to ensure security of supplies throughout the energy transition.

The installation of a new AIS double busbar at Glenmuckloch 132kV Substation, a two bay extension to the GIS double busbar at Glenglass 132kV Substation and the establishment of circa 9.3km 132kV L7 double circuit OHL between Glenglass and Glenmuckloch 132kV Substations, will help maintain system resilience and operability by enabling the connection of new sources of renewable generation in the area.

Keep network users and consumers at the heart of all our investment plans and decisions.

The completion of the SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project will allow SPT to satisfy network users' requests for connection to the SPT network and is consistent with SPT's statutory and licence responsibilities, including Licence Condition D4A.

Key stakeholders have been consulted during the development of the proposed solution and we will continue to engage with stakeholders throughout the project delivery process. Stakeholder engagement has included statutory consultees associated with the planning application for these works (e.g., Local Authority, SEPA, NatureScot) as well as Forestry Land Scotland. More detail on stakeholder engagement can be found in Section 8.4.

The completion of the SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project will continue to align with our future strategic ambitions.

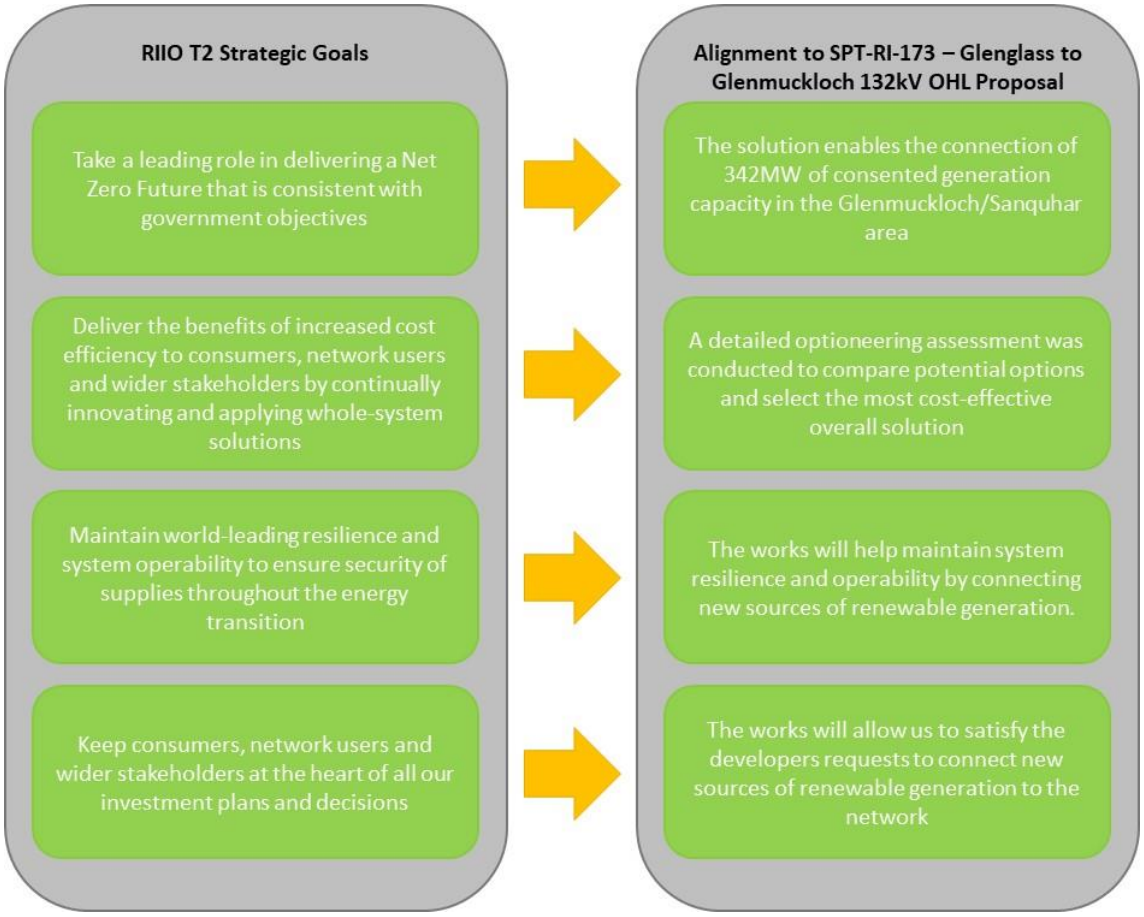

Figure 2: Alignment SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project with SPT RIIO-T2 Strategic Goals

5. Assessment of Options

The SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project enables the connection of consented renewable generation in the Glenmuckloch area, via the establishment of Glenmuckloch 132kV Substation and its connection to Glenglass 132kV Substation.

Various alternative options were considered to accommodate the connection of proposed renewable generation developments in the Glenmuckloch/ Sanquhar area.

The options assessed included a 'Do Nothing' option; connecting the planned Glenmuckloch 132kV Substation to alternative existing substation sites; and, alternative arrangements to establish the Glenmuckloch 132kV circuits.

5.1. Existing System Configuration at Glenglass 132kV Substation

The existing SPT 132kV network does not presently extend out to the location of the future Glenmuckloch 132kV Substation which is proposed to be established as part of this SPT-RI-173 – Glenglass to Glenmuckloch 132kV OHL project.

Glenglass 132kV Substation forms part of the southwest Scotland electricity transmission network and currently serves the Glenglass 33kV switchboard which provides connection to the SPT network for renewable generation sites in the nearby area.

Glenglass 132kV Substation currently provides a connection to two incoming 132kV OHL circuits from Blackhill 132kV substation. The site includes two 132/33kV, 90MVA transformers which provide two incoming 33kV circuits to the Glenglass 33kV GIS Switchboard.

As detailed in Figure 3, Glenglass 132kV Substation comprises the following:

- Blackhill No1 (132kV OHL circuit)
- Blackhill No2 (132kV OHL circuit) / Sandy Knowe (132kV 147MVA cable)
- T1 (132/33kV, 90 MVA, transformer)
- T2 (132/33kV, 90 MVA, transformer)
- Glenglass 33kV Switchboard

The connected and contracted generation position at Glenglass and Glenmuckloch 132kV substations, are detailed in Section 4 of this document.

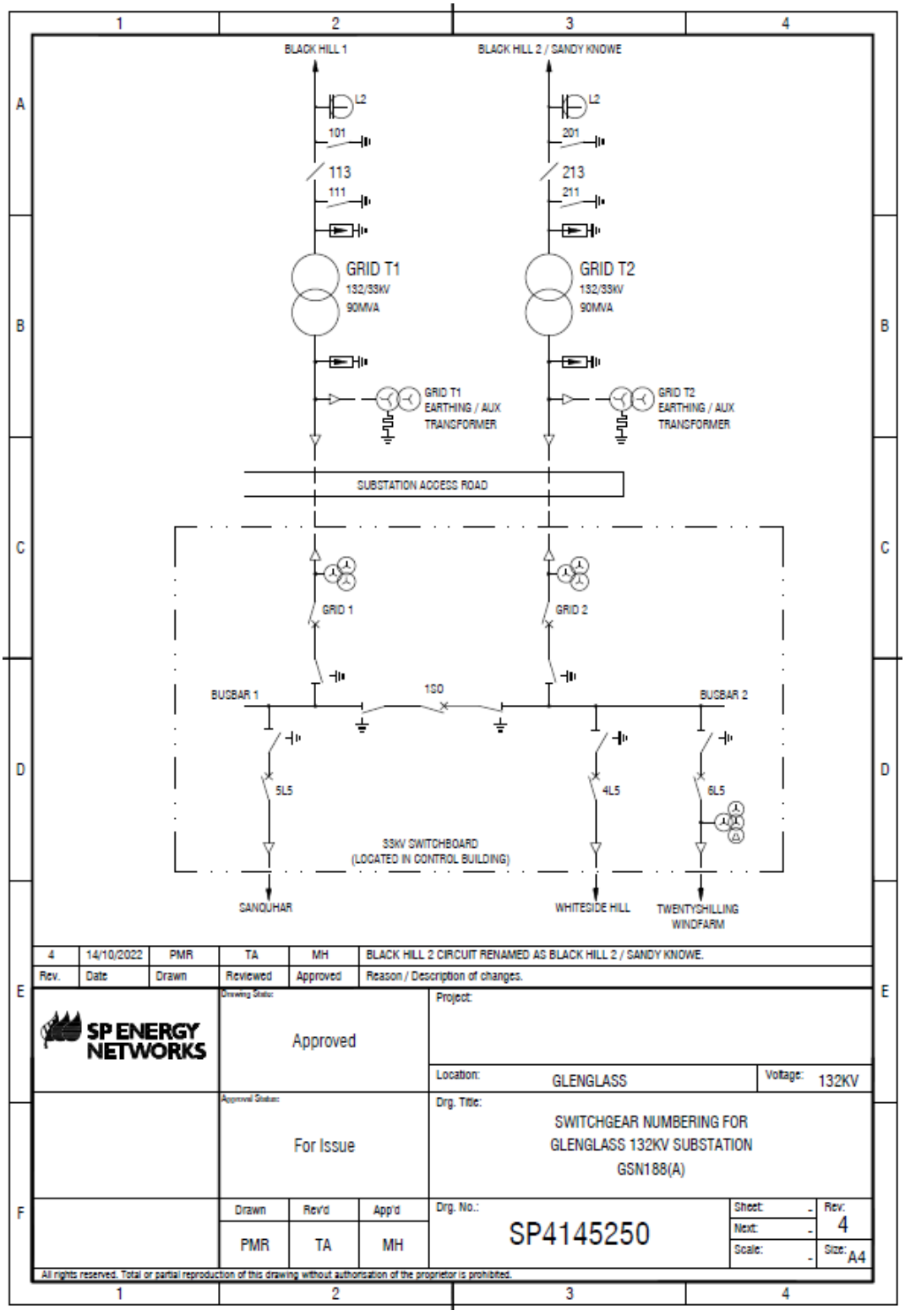

Figure 3: Existing Configuration – Glenglass 132kV Substation

5.2. Planned System Configuration at Glenglass 132kV Substation

The SPT-RI-302 – Glenglass 132kV Substation project's MSIP Stage 1 paper was submitted to Ofgem in January 2023. The scope of SPT-RI-302 at that time involved the reinforcement of the Glenglass 132kV Substation with the installation of a 10 Bay, double busbar, 132kV GIS switchboard at the site. Both the needs case and proposed works were supported by Ofgem in its provisional decision published on 20th September 2023.

In the period since January 2023, TO Construction Offers in respect of Rowancraig Wind Farm and Lorg Extension Wind Farm have been accepted, the latter requiring the installation of one further bay of 132kV GIS switchgear.

The resulting 11 Bay, double busbar, 132kV GIS substation at Glenglass will consist of 8 feeder bays, 2 Transformer bays and a bus coupler bay. The circuits to be connected are as follows:

- Blackhill No. 1
- Blackhill No. 2
- Glenglass 132/33kV 90MVA T1
- Glenglass 132/33kV 90MVA T2
- Sandy Knowe Wind Farm
- Sanquhar II Wind Farm (Funded via SPT-TOCO-188)
- Cloud Hill Wind Farm/ Rowancraig Wind Farm (now Funded via SPT-TORI-3102)
- Lorg Extension Wind Farm (Funded via SPT-TOCO-2556)
- Glenmuckloch No.1 (Funded via SPT-TORI-173)
- Glenmuckloch No.2 (Funded via SPT-TORI-173)

SPT-RI-173 is contingent upon the completion of SPT-RI-302. Note that the Glenmuckloch No.1 and No.2 132kV GIS bays listed above will be funded by this SPT-RI-173.

A single line indication of the planned Glenglass 132kV Substation is indicated in Figure 4 below.

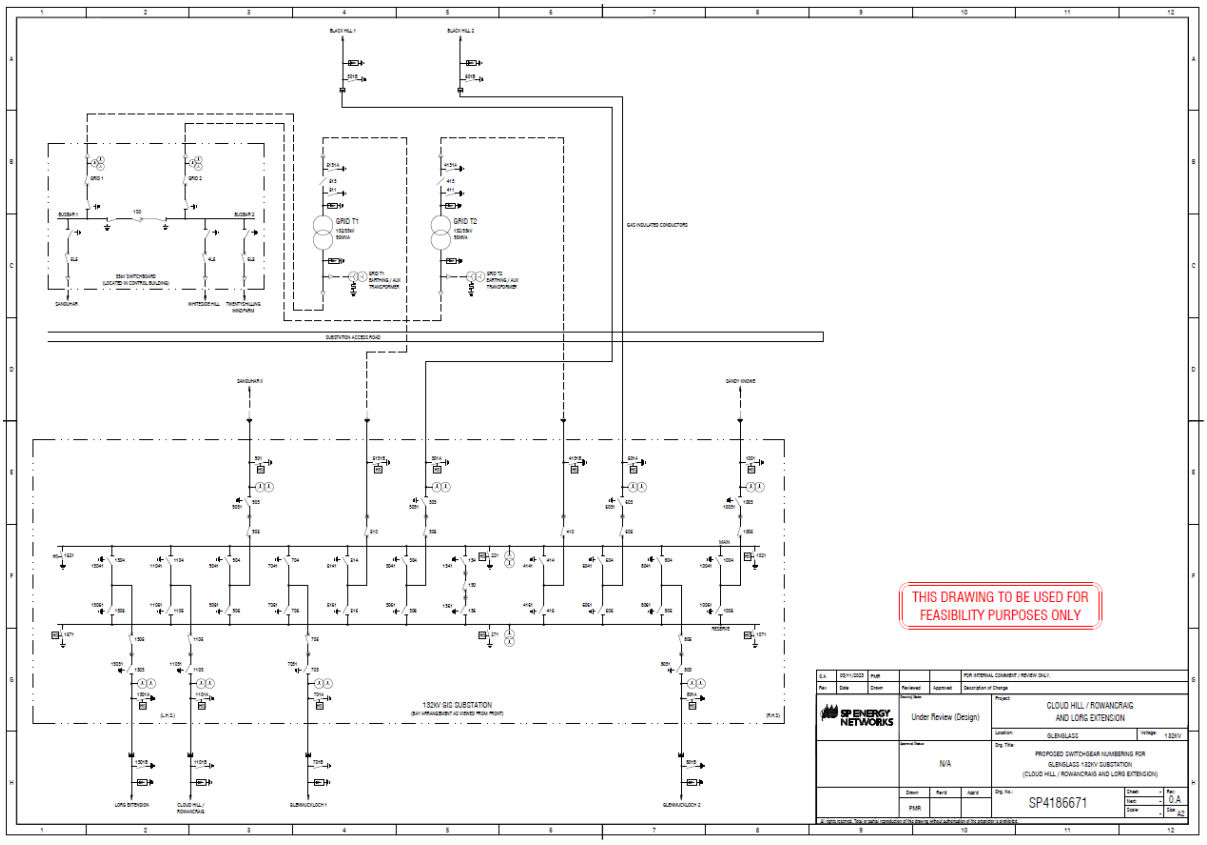

Figure 4: Planned Configuration – Glenglass 132kV Substation

5.3. Overview of Options

This section provides a description of each reinforcement option and details the key considerations. A summary of each option is described at the end of this section.

5.3.1 Option 1 – Do Nothing or Delay

A 'Do Nothing' or 'Delay' option is not credible in relation to this project and would be inconsistent with SPT's various statutory duties and licence obligations, including Licence Conditions D3 and D4A, which require SPT to comply with the NETS SQSS and to offer to enter into an agreement with the system operator upon receipt of an application for connection, such offers being in accordance with the STC and associated Construction Planning Assumptions provided by NGESO. The proposed works are identified as Enabling Works in the connection agreements relating to the projects in Table 4.

5.3.2 Option 2 – Glenglass to Glenmuckloch 132kV Connection

5.3.2.1 Option 2a - Glenglass to Glenmuckloch 132kV via OHL

This option requires the establishment of a new 132kV double circuit OHL, of L7 specification, between Glenmuckloch and Glenglass, which has an approximate route length of 9.3km. It involves the construction of an up to 11 bay double busbar 132kV AIS substation at Glenmuckloch and requires an extension of the Glenglass 132kV GIS Substation by two feeder bays, so as to accommodate the connection of the incoming 132kV OHL double circuit from Glenmuckloch 132kV Substation.

The Glenglass 132kV substation is being delivered as part of the scope of works for SPT-RI-302. The design of the 132kV GIS building at Glenglass has been developed with the provision of space within the building to accommodate the two additional 132kV feeder bays to connect to the Glenmuckloch 132kV OHL circuits as well as space for four future bays to accommodate further connections into Glenglass substation. Two of the four future bays are presently contracted as part of the Cloud Hill/ Rowancraig and Lorg Extension developments.

This option provides the most economical solution to achieving the requirements of SPT-RI-173 – Glenglass to Glenmuckloch 132kV OHL project in comparison to the alternative options assessed.

5.3.2.2 Option 2b – Glenglass to Glenmuckloch 132kV via Underground Cable

An alternative method of achieving a 132kV double circuit connection between Glenglass and Glenmuckloch 132kV Substations would be via underground cable. For this option, the works to connect the double circuit at both Glenglass and Glenmuckloch substations would be largely unchanged from the equivalent overhead line option; however, there may also be a requirement for reactive compensation equipment (i.e. shunt reactors) to be installed.

The installation of sections of underground cable within a project must balance economic, technical and environmental considerations. With underground cable, the incremental cost is a significant consideration.

As part of the development of SPT-RI-173, SPT engaged a specialist external consultancy to lead a process of identifying and selecting a cable route option and assessing the constructability of the route taking account of engineering considerations. Multiple cable routes were assessed, with their preferred route being approximately 12.5km with an estimated cost of around £69m for the 132kV double circuit cable connection. This is around four times more than the proposed 132kV overhead line, which demonstrates that this is not the most economic option for the connection from Glenglass to Glenmuckloch. An underground cable option was therefore discounted.

5.3.3 Option 3 – New Cumnock to Glenmuckloch 132kV OHL

This option requires the establishment of a new 132kV double circuit OHL, of L7 specification, between Glenmuckloch and New Cumnock. Similar to Option 2a, this option also involves the construction of an up to 11 bay, double busbar 132kV AIS substation at Glenmuckloch. Option 3 would also necessitate an extension of the New Cumnock 132kV AIS substation by two feeder bays, to accommodate the connection of the incoming 132kV OHL double circuit from Glenmuckloch 132kV Substation.

This option was considered, however discounted in advance of a detailed cost estimating exercise for the following reasons:-reasons: -

- The length of 132kV OHL route required for this option is more than double the length of the 132kV OHL route proposed in Option 2a and would be significantly more expensive.
    - The distance between the proposed Glenmuckloch substation and the existing New Cumnock substation is approximately 20km in a straight line. It can be expected that any proposed route would be at least 10-20% greater than the straight-line distance. Given the route length, the estimated capital cost of the 132kV L7 OHL would be in the region of £33m, which is more than double the estimated cost of the OHL for the proposed solution, and is only around £2m less than the overall cost of the proposed solution, prior to considering any of the substation works that would be required to deliver this solution.

- The development of the Glenmuckloch 132kV Substation is cost neutral in comparison to the other options.
    - The substation works required at Glenmuckloch 132kV Substation would be unchanged for when compared to Option 2a. These works are estimated at approximately £18m.
- When the works at Glenmuckloch 132kV Substation are combined with the overhead line cost outlined above, the total cost of these two aspects alone is significantly more expensive than the overall cost of the proposed solution, prior to considering any of the works required at the existing New Cumnock 132kV Substation.
    - The construction of two new feeder bays at New Cumnock, to accommodate the connection of the incoming 132kV OHL double circuit from Glenmuckloch 132kV Substation, would add further cost to this option, meaning that Option 3 is not economic when compared to Option 2a.

5.3.4 Option 4 – Coylton to Glenmuckloch 132kV OHL

This option requires the establishment of a new 132kV double circuit OHL, of L7 specification, between Glenmuckloch and Coylton. Similar to Option 2a, this option involves the construction of an up to 11 bay, double busbar 132kV AIS substation at Glenmuckloch. Option 4 would also necessitate an extension of the Coylton 132kV AIS substation by two feeder bays, as a minimum, to accommodate the connection of the incoming 132kV OHL double circuit from the future Glenmuckloch 132kV substation.

This option was considered, however discounted in advance of a detailed cost estimating exercise for the following reasons: -

- The length of 132kV OHL required for this option is around three times the length of the 132kV OHL route proposed in Option 2a and would therefore be significantly more expensive.
    - The distance between the proposed Glenmuckloch substation and the existing Coylton substation is approximately 25km in a straight line. It can be expected that any proposed route would be at least 10-20% greater than the straight-line distance. Given the route length, the estimated capital cost of the 132kV L7 OHL would be in the region of £41m, which is more than the total estimated cost of the proposed solution prior to considering any of the substation works that would be required at Glenmuckloch and Coylton substation to deliver this solution.
- The development of the Glenmuckloch 132kV Substation is cost neutral in comparison to the other options.
    - The substation works required at Glenmuckloch substation would be unchanged for this option when compared to Option 2a. These works are estimated at approximately £18m.
- When the works at Coylton 132kV Substation are combined with the overhead line cost outlined above, the total cost of these two aspects alone is significantly more expensive than the overall cost of the proposed solution, prior to considering any of the works required at the existing Coylton 132kV Substation.
    - The construction of two new AIS feeder bays at Coylton, to accommodate the connection of the incoming 132kV OHL double circuit from Glenmuckloch 132kV Substation, would add to the overall cost of this option, meaning that Option 4 is not economic when compared to Option 2a.

5.3.5 Option 5 – Blackhill to Glenmuckloch 132kV OHL

This option requires the establishment of a new 132kV double circuit OHL, of L7 specification, between Glenmuckloch and Blackhill. Similar to Option 2a, this option involves the construction of an up to 11 bay, double busbar 132kV AIS substation at Glenmuckloch. Option 5 would also necessitate an extension of the Blackhill 132kV GIS substation by two feeder bays, to accommodate the connection of the incoming 132kV OHL double circuit from Glenmuckloch 132kV Substation.

This option was considered, however discounted in advance of a detailed cost estimating exercise for the following reasons: -

- The length of 132kV OHL route required for this option is greater than the length of the 132kV OHL route proposed in Option 2a and would be more expensive.
    - The distance between the proposed Glenmuckloch substation and the existing Blackhill substation is approximately 14km in a straight line. It can be expected that any proposed route would be at least 10-20% greater than the straight-line distance. Given the route length, the estimated capital cost of the 132kV L7 OHL would be in the region of £23m, which is around £9m more than the cost of the OHL for the proposed solution.
- The development of the Glenmuckloch 132kV Substation is cost neutral in comparison to the other options.
    - The substation works required at Glenmuckloch substation would be unchanged for this option when compared to Option 2a. These works are estimated at approximately £18m.
- When the works at Blackhill 132kV Substation are combined with the overhead line cost outlined above, the total cost of these two aspects alone is significantly more expensive than the overall cost of the proposed solution, prior to considering any of the works required at the existing Blackhill 132kV Substation.
    - The construction of two GIS feeder bays at Blackhill, to accommodate the connection of the incoming 132kV OHL double circuit from the future Glenmuckloch 132kV substation, would not be more economic when compared to Option 2a.
    - There is space within the existing Blackhill 132kV GIS building for two additional GIS feeder bays; however, these would need to be installed adjacent to each other at one end of the switchboard. The entry to these GIS bays would need to be made via 132kV cable, which would add additional complexity and cost.

5.3.6 Option 6 – Glenmuckloch to future Substation (near ZV Route) 132kV OHL

This option requires the establishment of a new 132kV double circuit OHL, of L7 specification, between Glenmuckloch and a future 132kV substation next to the 400kV Strathaven – Harker (ZV) Route. The substation near ZV route would require 2 x 400/132kV transformers, 2 x 132kV line entry/transformer bays and 2 x 400kV line entry/transformer bays as a minimum, that would connect to ZV Route. Similar to other options, it also involves the construction of an up to 11 bay, double busbar 132kV AIS substation at Glenmuckloch.

This option was considered, however discounted in advance of a detailed cost estimating exercise for the following reasons: -

- The length of 132kV OHL route required for this option is more than double the length of the 132kV OHL route proposed in Option 2a and would be significantly more expensive.
    - The distance between the proposed Glenmuckloch substation and the nearest point on ZV Route is approximately 21km in a straight line. It can be expected that any proposed route would be at least 10-20% greater than the straight-line distance. Given the length, the estimated capital cost of the 132kV L7 OHL would be in the region of £35m, which is almost the same as the overall estimated cost of the proposed solution without considering any of the substation works that would be required to deliver this solution.
- The development of the Glenmuckloch 132kV Substation is cost neutral in comparison to the other options.
    - The substation works required at Glenmuckloch substation would be unchanged for this option when compared to Option 2a. These works are estimated at approximately £18m, therefore when combined with the overhead line cost outlined above, this option is significantly more expensive than the overall cost of the proposed solution, without considering any of the works required to establish a new substation to connect to ZV Route.
- The cost of constructing a substation near ZV Route to receive the 132kV OHL double circuit from Glenmuckloch would add significant cost, meaning that Option 6 is not more economic when compared to Option 2a.

5.4. Option Assessment

As described in our RIIO-T2 Business Plan Annex 8[9], while most engineering justification papers have a Cost Benefit Analysis (CBA) aligned with the RIIO-T2 CBA model, projects in the following categories do not:

- Live projects rolling over from RIIO-T1, since they have already initiated, with decisions made during the previous price control.
- Customer connection projects, as the proposed approach is based on agreement with the connecting party as they will bear a sizeable proportion of the costs incurred.
- TO Reinforcements associated with new connections, where the options considered are evaluated purely based on the lowest cost solution, which meets the project objectives, as the benefits are all comparable.
- Projects justified through the Network Options Assessment Process as these are subject to an extensive and rigorous CBA process by the Electricity System Operator who can consider market options, and different options which may be offered by Transmission Owners.

Projects in the four categories above have an associated document (this MSIP Re-Opener application in respect of the SPT-RI-173 – Glenglass to Glenmuckloch 132kV OHL project) explaining the feasible options and the reasoning behind the selection of the preferred investment option.

The options relating to SPT-RI-173 – Glenglass to Glenmuckloch 132kV OHL project are described in Section 5.2 above, while Table 7 below summarises the key benefits and disadvantage of each option, together with an indication of the current estimated cost.

[9] Annex 8 - Cost Benefit Analysis Methodology (spenergynetworks.co.uk)

Table 7: Option Benefits, Drawbacks and Selection Outcome

No.	Option	Estimated Capital Cost[10]	Key Advantage	Key Disadvantage	Option Outcome
1	Do Nothing or Delay	-	None	Failure to comply with statutory duties and licence obligations.	Rejected
2a	Glenglass to Glenmuckloch 132kV OHL	£35.279m	Most economic, co-ordinated and efficient option.	No disadvantage relative to other options.	**Proposed**
2b	Glenglass to Glenmuckloch 132kV Cable	£89.867m	Reduced visual impact.	Significantly higher overall cost.	Rejected
3	New Cumnock to Glenmuckloch 132kV OHL	>£51m (excludes works at New Cumnock 132kV Substation)	No advantage relative to Option 2a.	Requires the establishment of a new 132kV OHL double circuit with approximate route length of 22km (straight-line distance +10%), more than double that of Option 2a i.e. significant economic and environmental disadvantages relative to Option 2a.	Rejected
4	Coylton to Glenmuckloch 132kV OHL	>£59m (excludes works at Coylton 132kV Substation)	No advantage relative to Option 2a.	Requires the establishment of a new 132kV OHL double circuit with approximate route length of 28km (straight-line distance +10%), more than three times that of Option 2a i.e. significant economic and environmental disadvantages relative to Option 2a.	Rejected
5	Blackhill to Glenmuckloch 132kV OHL	>£41m (excludes works at Blackhill 132kV Substation)	No advantage relative to Option 2a.	Requires the establishment of a new 132kV OHL double circuit with approximate route length of 15km (straight-line distance +10%), some 4-5km greater than that of Option 2a i.e. significant economic and environmental disadvantages relative to Option 2a.	Rejected
6	Glenmuckloch to future Substation (near ZV Route) 132kV OHL	>£53m (excludes works at new substation on/near ZV Route)	No advantage relative to Option 2a.	Requires the establishment of a new 132kV OHL double circuit with approximate route length of 23km (straight-line distance +10%), which is more than double that of Option 2a, as well as the establishment of a new 400/132kV substation near ZV Route i.e. significant economic and environmental disadvantages relative to Option 2a.	Rejected

Option 2a is therefore the preferred investment option, enabling the economic, efficient and co-ordinated connection of proposed renewable generation developments in the Glenmuckloch/ Sanquhar area.

[10] All values are in 2018/19 prices.

Upon completion of the planned SPT-RI-236 Glenmuckloch to Redshaw and SPT-RI-2060 Redshaw 400kV Substation works, the SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL works will continue to be required in order to support the connection of further renewable generation in southwest Scotland e.g. at New Cumnock 132kV Substation and Glenglass 132kV Substation, as indicated in Table 4.

6. Proposed Works

6.1. Project Summary

As discussed above, the most appropriate option to enable the economic, efficient and co-ordinated connection of proposed renewable generation developments in the Glenmuckloch/ Sanquhar area is to establish a new Glenmuckloch 132kV Substation and an approximate 9.3km 132kV OHL from Glenmuckloch to Glenglass 132kV Substation.

The associated works are summarised in the following sections (a) to (d).

a) Pre-Engineering Works

The following list is indicative based on previous experience of such sites and as such should not be read as definitive. Seeking to drive efficiencies throughout the project, any surveys that have been undertaken for the site and are still suitable should be reused.

The following surveys will be carried out:

- Topographical survey of the site.
- GPR survey of areas to be excavated to validate approximate locations of buried services.
- Ground bearing capacity checks.
- Geo Environmental Investigation to identify the relevant geotechnical parameters to facilitate the civil engineering design works.
- Earthing Study.
- Insulation Co-ordination Study.
- Define final tower positions for Glenglass to Glenmuckloch circuits.
- Transport Survey to assess the access of the new Equipment.
- Environmental Study.

b) Glenglass 132kV Substation

Glenglass 132kV Substation will be delivered as part of the SPT-RI-302 project, as described in Section 5.2. At Glenglass 132kV substation there will be a requirement for 2 x 132kV GIS feeder bays to be installed to connect the No.1 and No.2 incoming circuits from Glenmuckloch 132kV Substation. It is proposed that these 132kV GIS feeder bays are installed during the works for SPT-RI-302 at Glenglass, but funded via this SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project. The works at Glenglass are summarised as follows:

- Extend the GIS substation to install two feeder bays for the two 132kV circuits to Glenmuckloch substation.
- Connect the Glenmuckloch No.1 and No.2 circuits to the new 132kV bays.
- All control and protection works.
- All environmental and civil works.

The proposed configuration of Glenglass 132kV Substation is indicated in Figure 4 above.

c) Glenmuckloch 132kV substation

Glenmuckloch 132kV Substation will be of an outdoor AIS design. The primary civil engineering works associated with this element of the project will comprise:

- The design and construction of the site civil platform in the substation area and in the area of the Glenglass overhead line entry;
- The design and construction of foundations and structures necessary to support the equipment within the areas above; and
- Enabling works to achieve the above e.g. works to facilitate temporary and/or enduring accesses for construction, operation and maintenance purposes.

The Glenmuckloch 132kV Substation will be sized to accommodate up to 11 bays as part of its initial construction under SPT-RI-173, and shall be capable of being extended by at least a further three bays as required under SPT-RI-236.

Glenmuckloch 132kV AIS substation will be configured to ensure adequate capacity to accommodate future upgrades as per SPT-RI-236, which is expected to involve Glenmuckloch 132kV Substation incorporating up to four 360MVA 400/132kV Super Grid Transformers (SGT).

Glenmuckloch 132kV Substation shall be configured initially as follows, and shall be funded via SPT-RI-173 unless otherwise indicated below:

- Glenmuckloch Pumped Storage Hydro No.1 (funded via SPT-TOCO-312)
- Bus Coupler
- Future SGT ('Skeleton Bay' comprising busbar disconnectors to minimise future outage needs)
- Glenmuckloch Pumped Storage Hydro No.2 (funded via SPT-TOCO-312)
- Lethans Wind Farm / Lethans Collector (funded via SPT-TORI-2792)
- Future SGT ('Skeleton Bay' comprising busbar disconnectors to minimise future outage needs)
- Glenglass No.1
- Space to allow for future Bus Section(s) to be installed
- Glenglass No.2
- Future SGT ('Skeleton Bay' comprising busbar disconnectors to minimise future outage needs)
- Hare Hill Repowering Wind Farm (funded via SPT-TOCO-2786)

The site shall be designed to be capable of further expansion as part of SPT-RI-236 in order to accommodate the following additional bays:

- Second Bus Coupler
- Additional SGT Bay

The site shall also be designed for the future establishment of a local 400kV Substation.

The works at Glenmuckloch 132kV Substation shall include the termination of the two 132kV circuits from Glenglass together with all control and protection work and all associated environmental and civil works.

The proposed initial development and configuration of Glenmuckloch 132kV Substation is indicated in Figure 5 below.

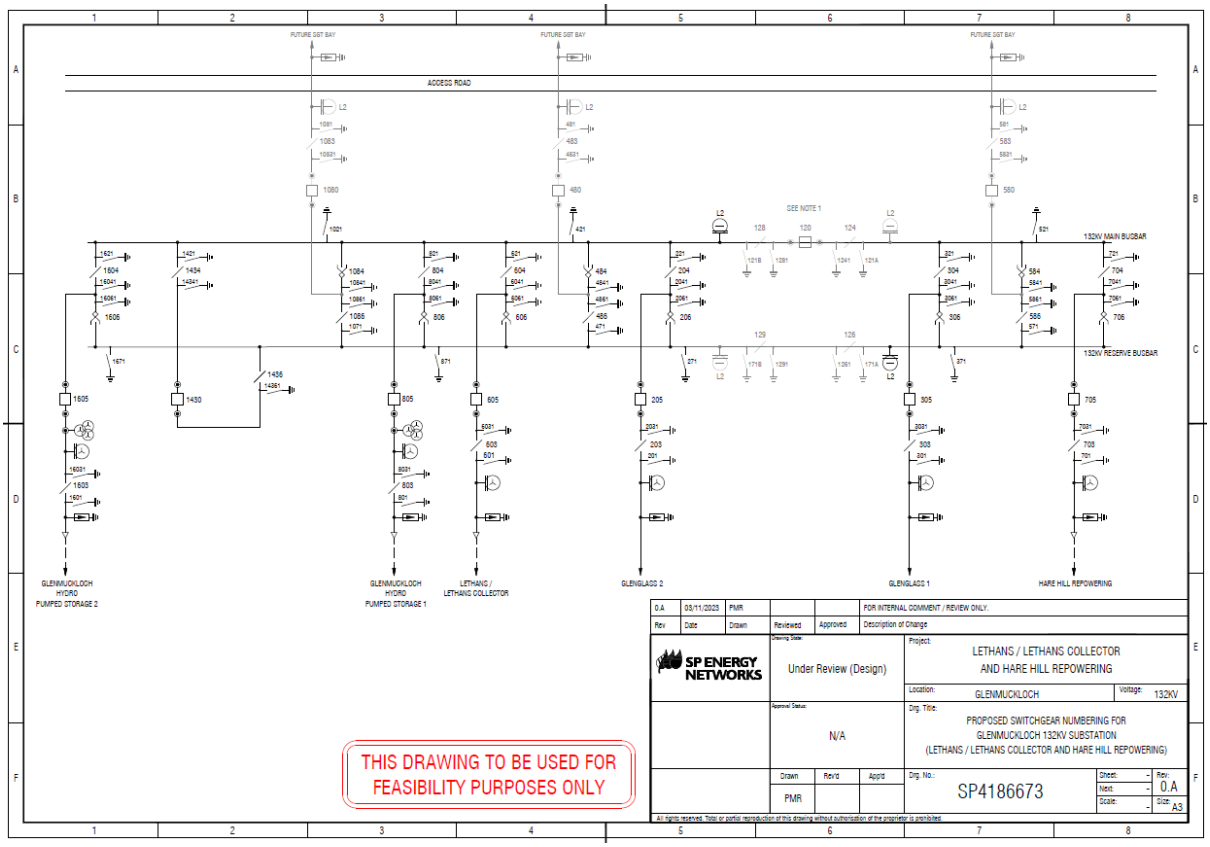

Figure 5: Proposed Configuration – Glenmuckloch 132kV Substation

d) Glenglass to Glenmuckloch 132kV OHL

A 132kV OHL double circuit will be established between two new GIS feeder bays at Glenglass 132kV GIS substation and two new AIS feeder bays at the future Glenmuckloch 132kV AIS substation.

The proposed route for this OHL circuit is approximately 9.3km in length and will be constructed using new 132kV L7c tower and a twin UPAS double circuit arrangement. This 132kV OHL circuit is required to provide a summer rating of 352MVA. The overhead line works are summarised as follows:

- Establish a 132kV L7 double circuit OHL between Glenglass and Glenmuckloch 132kV substations, circa 9.3km.
- String each circuit with twin UPAS conductor operating at 90°C.

The proposed 132kV OHL route from Glenmuckloch 132kV Substation to Glenglass 132kV Substation is indicated in Figure 6 below.

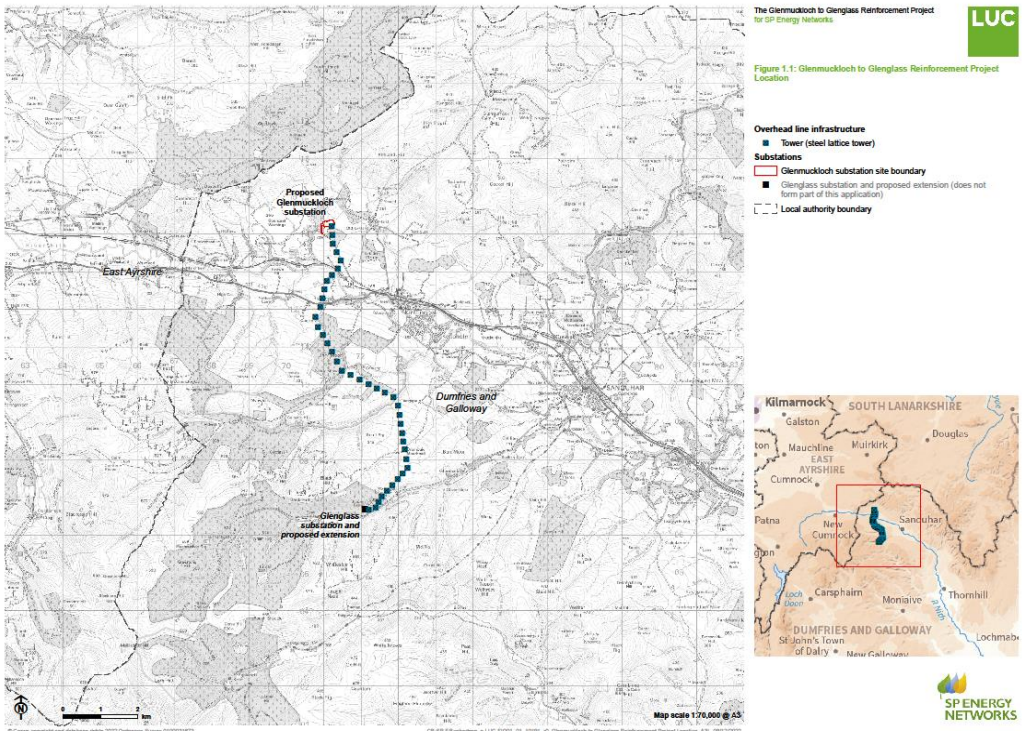

Figure 6: Proposed Glenglass to Glenmuckloch 132kV OHL Route

6.2. Environmental and Consents Works

Section 37 consent is being sought from the Scottish Ministers to install and keep installed the new double circuit 132kV steel lattice tower OHL. Deemed planning permission is also being sought for the 132kV OHL and the proposed Glenmuckloch substation, as well as the ancillary development. Relevant landowner agreements will also need to be put in place where required.

The Section 37 application to the Energy Consents Unit has been accompanied by an Environmental Impact Assessment Report (EIA Report). The information contained in the EIA Report fulfils the requirements of the EIA Regulations and will enable Scottish Ministers as the decision-making authority, to make their decisions on the application for Section 37 consent and deemed planning permission.

The EIA Report details the findings of the assessment of the likely significant effects of the proposals on the environmental in terms of its construction and operation. The assessment forms part of the wider process of EIA, which is undertaken to ensure that the likely significant effects, both positive and negative of certain types of development are considered in full by the decision maker prior to the determination of an application for Section 37 consent and for deemed planning permission.

The main strategy for minimising adverse environmental effects of the proposals will be through careful OHL routeing. While some environmental effects can be avoided through careful routeing, other effects are best mitigated through local deviations of the route, the refining of tower locations and appropriate construction practices. Additionally, in certain cases, specific additional mitigation measures will be required and these have been identified through the EIA process.

Consultation has taken place with Statutory stakeholders including SEPA and Nature Scot in relation to the proposals. Consultation was also undertaken with all other relevant stakeholders including the wider public and landowners.

7. Project Cost Estimate

As agreed with Ofgem, a further submission will be made at the right time relating to the associated amendments to the outputs, delivery date and allowances to be detailed in LSpC 3.14 Appendix 1. The detail in this section is therefore indicative pending that further submission.

7.1. Estimated Total Project Cost

Aligned with the format of the Re-Opener Pipeline Log, Table 8 details expected energisation year and our current view of potential direct capital expenditure in RIIO-T2.

Table 8: Estimated Incidence of Expenditure

	Potential direct capex value per year, £m, 18/19 price base									
Energisation Year	Pre-RIIO-T2: direct capex	Yr. 21/22: direct capex	Yr. 22/23: direct capex	Yr. 23/24: direct capex	Yr. 24/25: direct capex	Yr. 25/26: direct capex	Yr. 26/27 (T3): direct capex	Yr. 27/28 (T3): direct capex	RIIO-T2 Total: direct capex	Total: direct capex
2027/28	0.134	0.337	0.306	1.022	1.562	9.249	21.154	1.514	12.476	35.279

7.2. Potential Volume Driver Allowance

Applying the RIIO-T2 Generation Connections VDUM to this project results in a £12.865m allowance provided by the VDUM. The allowance is calculated as per Table 9 below. Please note that this excludes the further allowance permitted under Licence Special Condition 3.36 Opex escalator to provide a better comparison to direct expenditure.

Table 9: Volume Driver Allowance

Volume Driver (*2018/19 price base*)		£m/unit	Unit	Volume Driver Allowance (£m)
Project	Fixed Cost	1.700	1	1.700
Shared Use	New Build/Extension Substation, MVA	0.010	352	3.520
	132 new conductor km (tower)	0.411	18.6	7.645
Total				**12.865**

Table 10: Comparison of Volume Driver Allowance and Estimated Cost

	Potential direct capex value per year, £m, 18/19 price base									
Description	Pre-RIIO-T2: direct capex	Yr. 21/22: direct capex	Yr. 22/23: direct capex	Yr. 23/24: direct capex	Yr. 24/25: direct capex	Yr. 25/26: direct capex	Yr. 26/27 (T3): direct capex	Yr. 27/28 (T3): direct capex	RIIO-T2 Total: direct capex	Total: direct capex
Allowance	0.000	0.000	0.000	0.000	3.216	3.216	3.216	3.216	6.433	12.865
Cost	0.134	0.337	0.306	1.022	1.562	9.249	21.154	1.514	12.476	35.279
Variance	-0.134	-0.337	-0.306	-1.022	1.654	-6.033	-17.937	1.702	-6.044	-22.414

The potential VDUM allowance for the project is lower than the estimated cost by £22.414m. This is more than £4.24m, which is the threshold set in LSpC 3.14.6(a) for consideration under this uncertainty mechanism.

It is acknowledged that a portion of the investment occurred in RIIO-T1, however, there was no means to fund such works. It was not a T1 baseline scheme and the T1 uncertainty mechanism (LSpC 6F) could not fund as the output would be delivered in RIIO-T2.

7.3. Regulatory Outputs

The indicative primary asset outputs are identified in Table 11 below:

Table 11: Regulatory Outputs Table (Volumes)

Asset Category	Asset Sub-Category Primary	Voltage	Forecast Additions[11]	Forecast Disposals
Circuit Breaker	CB (Gas Insulated Busbar) (ID)	132kV	2 units	-
Circuit Breaker	CB (Air Insulated Busbar) (OD)	132kV	3 units[12]	-
Substation Platform	Platform Creation	132kV	1	-
Overhead Tower Line	OHL (Tower Line) Conductor	132kV	18.6km (2 x 9.3km)	-
Overhead Tower Line	Tower	132kV	40	-
Overhead Line Fittings	Fittings	132kV	80	

[11] Note: Forecast Additions are indicative pending further detail design.

[12] Note: The circuit breaker count reflects those additional units which are to be funded from SPT-RI-173. A further 4 units will be funded via SPT-TOCO-312 (2 units), SPT-TOCO-2786 (1 unit) and SPT-RI-2712 (1 unit).

8. Project Delivery

We have applied our project management approach to ensure that this project work is delivered safely, and in line with the agreed time, cost and quality commitments. We have a proven track record of delivering essential transmission network upgrade projects and will draw upon this knowledge and experience to effectively manage this project. We have assigned a dedicated Project Manager to this project who will be responsible for overall delivery of the scope and is the primary point of contact for all stakeholders.

8.1. Delivery Schedule

A standard approach has been applied to the planning phase of this project and that will continue for the reporting and the application of processes and controls throughout the project lifecycle. Table 12 summarises the key project milestones within the delivery schedule.

Table 12: Key Project Milestone

Milestone	Project Phase	Estimated Completion Date
1	Conclude Missives on Glenmuckloch s/s	March 2024
2	ITT OHL	April 2024
3	Section 37 Granted	October 2024
4	Earthworks ITT	April 2025
5	Civils ITT	April 2025
6	Award OHL Contract	March 2025
7	Award Earthworks and Civils Contracts	January 2026
8	Substation site Set up	March 2026
9	BOP ITT	February 2026
10	OHL Site works Commencement	April 2025
11	Award BOP Contract	September 2026
12	Commissioning	June 2027

Regular meetings with the Project and Construction Management Teams shall be undertaken to assess the ongoing effectiveness of the Project Management interfaces.

The Project Manager will facilitate internal Project Team Meetings, in which project progress and deliverables will be reviewed and any arising risks or issues will be discussed and addressed.

8.2 Alignment with Other Projects

The delivery of this SPT-RI-173 Glenglass to Glenmuckloch 132kV OHL project will be co-ordinated with the delivery of SPT-RI-302 at Glenglass 132kV Substation, as well as the works associated with the various generation developments detailed in Table 4.

8.3 Project Risk and Mitigation

A Project Risk Register was generated collaboratively during the project kick-off meeting to identify any risks, which if realised, could result in deviation from the project delivery plan. Mitigation strategies have also been developed to manage the risks identified and these will be implemented by the Project Manager. The risk register shall remain a live document and will be updated regularly by the project team. Currently, the top project risks are:

[redacted]

8.4 Quality Management

SPT adopts a "life cycle" approach to Quality Management in major project delivery. Our Management Systems are certified to ISO 9001, ISO 14001 and ISO 45001. Various areas applicable to these standards ensure a quality product is delivered. The significant areas detailed below:

Quality Requirements During Project Development

Any risk or opportunity that may affect the quality of the product are detailed in the Project Risk Register (that is noted in Section 6.5 above).

The suppliers of main equipment may also receive a Factory Acceptance Test Inspection when the asset is being built.

Quality Requirements in Tenders

Each contract that SPT issues has a standard format. Specifically in relation to quality, this will include a Contractors' Quality Performance Requirement (CQPR). This CQPR represents a specification that details roles and responsibilities for all parties during the works, frequency and format of reporting. It will also specify the document management process to be adhered to during the delivery of the project. In addition to the CQPR, each project has a contract specific Quality Management Plan, detailing the inspection and testing regime for works as well as the records to be maintained.

Monitoring and Measuring During Project Delivery

SPT Projects undertake regular inspections on projects and contractors to monitor and measure compliance with SPT Environmental, Quality and Health and Safety requirements, as detailed in the contract specifications for the work. All inspections are visual, with the person undertaking the inspection ensuring that evidence of the inspection and any actions raised are documented.

The following inspections are completed:

- Quality Inspections (monthly)
- Environmental Inspections (monthly, with weekly review by third party Environmental Clerk of Works)
- Safety Assessments & Contractor Safety Inspection (daily, with full time Site Manager)
- Project Management Tours (monthly)

The scope of audits and Inspections is to determine compliance with:

- Procedures & Guides
- Planned arrangements for ISO 9001, 14001 & 18001
- Legal and other requirements.

Post Energisation

SPT Projects and SPT Operations carry out a Defect Liability Period Inspection within the Contract Defect Liability Period with the aim of identifying any defects and rectifying them with the contractors.

8.5 Stakeholder Engagement

SPT is committed to delivering optimal solutions in all the projects we undertake. A key part of this is engaging with relevant stakeholders throughout the project development and delivery process. Stakeholders can include customers, regulatory bodies and other statutory consultees, national and local government, landowners, community groups, and local residents and their representatives (e.g. MPs, MSPs and councillors).

Community impacts associated with construction activities are considered at project initiation by completion of a Community Communications Plan, which details the stakeholders relevant to the project, the communication channels that will be used to engage with them, the information that will be provided to and sought from them, and the timescales over which this will happen. It considers any sensitivities that may require increased stakeholder consultation and details specific events that will be held with stakeholders during the development of the project.

As part of this project, SPT has engaged with statutory consultees associated with the planning application for these works - the Local Authority, SEPA and NatureScot - and the third-party landowner Forestry Land Scotland. Multiple public consultations have been carried out with other stakeholders, including community councils and local residents. A consultation feedback report will accompany the planning application. All document relating to the planning application can be found at; Glenmuckloch to Glenglass Reinforcement Project - SP Energy Networks.

[redacted]

9. Conclusion and Recommendations

This MSIP Re-opener application demonstrates the need to establish Glenmuckloch 132kV Substation, with works commencing in the RIIO-T2 period (April 2021 – March 2026) and completing in the RIIO-T3 period. This project will enable the timely and efficient connection of up to 342MW of contracted onshore generation, comprising the consented 132MW Lethans Wind Farm and 210MW Glenmuckloch Pumped Storage hydro scheme.

As well as enabling the connection of the 342MW of consented generation noted above, these works will also facilitate the future extension of the transmission network from Glenmuckloch to the planned Redshaw 400kV Substation (ref. SPT-RI-236), enabling the connection of a further 650MW of contracted renewable generation capacity in southwest Scotland.

The main conclusions of this submission are:

- The timely connection of low carbon generation, including onshore wind, will play a vital role in reaching legislated net zero targets, and is aligned with SPT's RIIO-T2 strategic goals.
- It is necessary to invest in transmission infrastructure at Glenmuckloch 132kV Substation, and between Glenmuckloch 132kV and Glenglass 132kV Substations, to facilitate the connection of 342MW of contracted onshore generation, this having been identified as the most economic and efficient option.
- An MSIP Re-opener application is required. Submission of this MSIP Re-opener application is aligned with the contracted connection programme.

We, respectfully, request Ofgem's agreement to the following:

- The option being progressed addresses a clear customer need and represents value to GB consumers, therefore, the works should proceed based on the preferred solution (Option 2a).
- Efficient expenditure is fully funded, as necessary to maintain programme timelines and mitigate project delivery risk e.g., order long-lead equipment, prior to the second stage MSIP submission and assessment.

Appendix A - SP Transmission System, Geographic Overview