Wyseby 400kV Substation

Site Strategy EJP
Version: 1.0
11/12/2024

Wyseby 400kV Substation			
Name of Scheme	Wyseby 400kV Substation		
Investment Driver	Local Enabling (Entry)		
BPDT / Scheme Reference Number	SPT200505		
Outputs	• 400kV Platform Creation, with space accommodating 24-bay 400kV substation • 400kV CB – 15 units as the first stage • 400kV OHL (Tower Line) Conductor – 11.08km (2 x double circuits, 2.61km and 2.93km)		
Cost	£66.99m		
Delivery Year	2031		
Applicable Reporting Tables	BPDT (Section 5.1 - Project Meta Data, Section 6.1 - Scheme C&V Load Actuals and Section 11.10 Contractor Indirects)		
Historic Funding Interactions	N/A		
Interactive Projects	N/A		
Spend Apportionment	**ET2**	**ET3**	**ET4**
	£0.25m	£55.54m	£11.21m

Table of Contents

Table of Contents 2
1 Executive Summary 4
2 Introduction 5
3 Background Information 6
3.1 ZV Route 6
3.2 Active Generation Development in the Area 8
3.3 The WCN2 Project 9
4 Optioneering 11
4.1 Baseline – Do Nothing or Delay 11
4.2 Option 1 – Double Tee off of ZV 400kV Circuits 11
4.3 Option 1a – New Wyseby 400kV Substation with double-circuit turn-in 13
4.4 Option 2 – 400kV OHL Connection to Gretna 15
4.5 Option 3 – 400kV Cable Connection to Gretna 17
4.6 Option 4 – Moffat- Harker Circuit Turn In 19
4.7 Selected Option – ZV circuits turn into Wyseby 400kV Substation (Option 1a) 25
4.8 Whole System Outcomes 25
5 Proposed Works & Associated Cost 25
5.1 Project Summary 25
5.2 Stage 1 25
5.2.1 Estimated Total Project Cost (Stage 1 only) 27
5.2.2 Regulatory Outputs 27
5.3 Stage 2 28
5.4 Stage 3 28
6 Environmental and Consents Works 28
7 Deliverability 29
7.1 Delivery Schedule 29
7.2 Risk and Mitigation 30
7.3 Quality Management 30
7.3.1 Quality Requirements During Project Development 30
7.3.2 Quality Requirements in Tenders 30
7.3.3 Monitoring and Measuring During Project Delivery 31
7.3.4 Post Energisation 31

7.4 Environmental Sustainability 31
7.5 Stakeholder Engagement 33
8 Eligibility for Competition 34
9 Conclusion 34
10 Appendices 34
Appendix A: Maps and Diagrams 35

1 Executive Summary

This engineering justification paper (EJP) sets out SP Transmission's (SPT) current strategy for the development of a new 400kV substation and the new double circuit overhead line to enable the connection of renewable generation. SPT plans to establish:

(i) A new 400kV substation, named Wyseby, with a minimum 15 feeder bays to accommodate the **current contracted connections** in this area. However, development work is continuing to determine whether the substation should tie into the new **WCN2** 400kV Overhead Line (OHL) which is outlined under the tCSNP2 proposals; with this in mind, the substation design will be sufficient to accommodate up to 24 feeder bays;

(ii) Two double circuit L8 400kV overhead lines (circa 2.61km and 2.93km) between the new Wyseby substation and existing 400kV circuits between Moffat/ Elvanfoot (in SPT area) and Harker (in NGET area) (as part of the **ZV** Route); and

(iii) Potential change or relocation of the primary components of the Series Compensation installed on the ZV circuits (at Gretna and Moffat respectively).

The expected project delivery date for this scheme is October 2031. The estimated project cost is £66.99m.

This EJP is submitted for Ofgem's assessment of the need case for the project and the selection of the preferred option in order to provide sufficient funding for pre-construction and early construction activities. A cost assessment submission will be made to Ofgem under the Load Related Reopener at an appropriate time within the RIIO-T3 period.

2 Introduction

This EJP sets out SP Transmission's plans to establish a new 400kV substation which is in direct response to new connection applications in this area in this area and will require close coordination with the new 400kV double circuit to be established under the WCN2 project. WCN2 will create a new Scottish-England cross border route and the proposed location of Wyseby 400kV Substation could offer a logical location in terms of connectivity between the existing 400kV system (ZV Route) and this new 400kV double circuit. Wyseby 400kV substation does not form part of the scope of WCN2.

The recommended investment will follow a **staged approach** to meet the customer requirements, fulfilling the engineering and planning standards set out in the SQSS, and put in place a design which is capable of expansion. The completion of Wyseby 400kV substation and its connection to the ZV route circuits are the 'least regret' investment option, providing the following benefits:

- Enabling the connection of Wyseby Hill Energy Farm in a timely manner. The construction of a substation at 400kV will connect this 750MW development as well as other contracted applications which have been received in this area.
- Given the proposed location of Wyseby 400kV substation this creates an opportunity to coordinate efficiently and effectively with strategic works in this area. The requirement for a new power corridor has been triggered to provide additional Scottish/England cross border capacity. This strategic reinforcement is referred as WCN2 and will establish a new 400kV route between Kilmarnock South and the north of NGET's licence area. Following a recommendation in the 7th Network Options Assessment (NOA7) for a 'notional' west coast reinforcement, the WCN2 project was developed and has subsequently received a Proceed signal from the NOA7 Refresh undertaken to support the Holistic Network Design (HND) and further recommended by the Transitional Centralised Strategic Network Plan 2 (tCSNP2), or Beyond 2030 report, published by the ESO in March 2024.

For these reasons Wyseby 400kV is a key node underpinned by several contracted generation developments but can serve as an integrated part of strategic plans in the southwest of Scotland and across the border. The investment drivers require the establishment of infrastructure at different times. As such the development of Wyseby 400kV substation is planned in three discrete stages which are:

Stage 1: Initial stage [by 2031]

Establish a new 400kV substation at Wyseby with:

- 15 x 400kV bays total (11 feeder and transformer bays, 2 bus couplers and 2 bus sections) to connect generation and provide the connection to the ZV Route circuits, under SPT-RI-2320.
- The design of the substation will be sufficient to accommodate 6 Super Grid Transformers (SGTs) as part of the contracted connections into the area as well as spare 400kV bays for any future connections.

Stage 2: Further Development stage

Contracted and future applicants in the region can be connected to Wyseby 400kV substation. Each connection will be assessed and arranged in line with the engineering standards and network operational considerations.

Stage 3: Integration Stage [around 2036/2037]

Given the proposed WCN2 corridor as signalled via the NOA, HND and tCSNP2, this new 400kV double circuit corridor can be connected in and out of Wyseby. The initial design will be accommodating the arrangement shown in Figure 1.

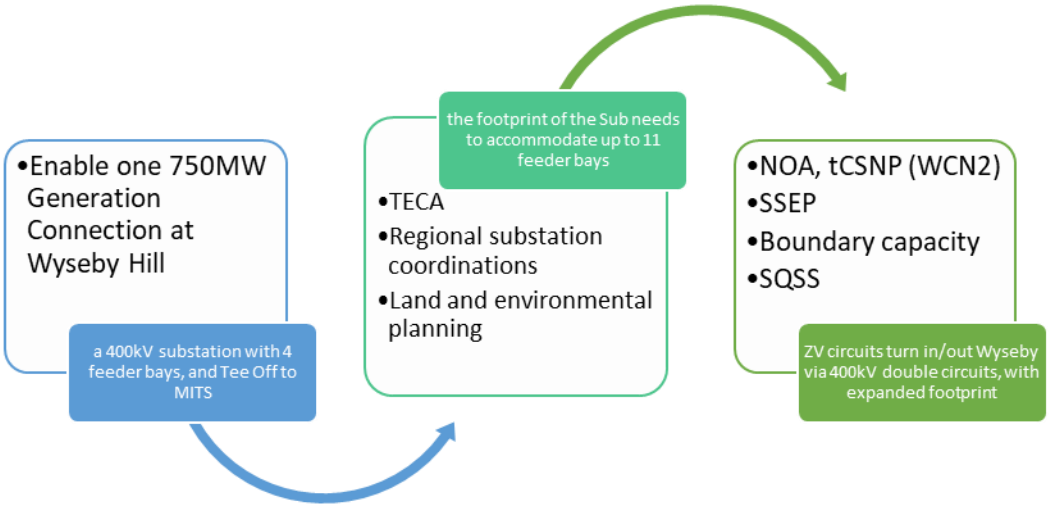

Figure 1 *: the Planning Evolvement and Staging Process of Wyseby Substation*

The expected project delivery date for stage 1 of the reinforcement scheme is 31st October 2031 with a total estimated cost of £66.99m.

This EJP is submitted for Ofgem's assessment of the need case for the project and the selection of the preferred option in order to provide sufficient funding for pre-construction and early construction activities. A full cost submission will be made at the appropriate time.

3 Background Information

3.1 ZV Route

The 400kV double circuit between Strathaven and NGET's Harker substation constitute the western AC circuits crossing the B6 system boundary. This 126km route [also known as ZV Route] is constructed with L8 towers and is proposed to be reconductored with HTLS conductor by the schemes VERE and EHRE recommended by the tCSNP2 process. Substations at Coalburn, Elvanfoot, Moffat and Gretna are connected along the route. To enhance the B6 boundary transfer capability, series compensation has been installed on the Harker circuit at Moffat and the Elvanfoot circuit at Gretna.

Figure 2 and Figure 3 show the area of the system that it is proposed to establish the new Wyseby 400kV substation in, subject to further routing and siting studies.

Figure 2: Geographical location of the proposed scheme with respect to the wider network in South West Scotland area.

Figure 3: The existing transmission network in the area – extracted from Networks Diagram of the Existing SPT Systems).

3.2 Active Generation Development in the Area

Bilateral Connection Agreements are in place between NESO and the developers of the generation projects detailed in Table 1. In each case, the SPT-RI-2320 Wyseby project is identified as the Enabling Works, in combination with SPT-RI-231 (NOA. Ref. EHRE), corresponding to Transmission Owner Construction Agreements that are in place between NESO and SPT. The works as outlined in section above noted as "Stage 1" would facilitate the connection of these generators to SPT's system.

Table 1: Contracted Generation Dependent Upon SPT-RI-2320 (Stage 1 Works at Wyseby)

Connecting Substation	Contracted Development	Consent Status	TECA S[1]	Contracted Energisation D	SPT-RI-2320
[redacted]					
Total Capacity (GW)	-		-	-	**1.77GW**

*This connection is also contingent on the completion of Stage 3 of the Wyseby development, i.e. the integration of WCN2.

TECA Legend

TECA Probability	Designated Colour
High	
Medium	
Low	

[1] Transmission Economic Connections Assessment (TECA) – this assessment represents SPT's best view of the contracted generation landscape to 2036 and forms the basis for evaluating the timely delivery of reinforcement works. This regular assessment activity provides updated projections of renewable development in Scotland, and feeds into SPT's plans, ensuring the investment best meets the needs of users and customers.

In addition to the contracted generation in Table 1, there are more active applications from energy storage and/or renewable generators in the same area which if contracted would total **1.96GW** of generation connections into Wyseby 400kV substation.

This is a key point to note as the contracting of 1.96GW of generation connections into Wyseby 400kV substation would result in a change of the proposed connectivity into the ZV Route corridor from a double tee off connection to a full "turn in" which is outlined in the later sections of this EJP.

3.3 The WCN2 Project

WCN2 provides an increase to the B6 transfer capability by establishing a new 400kV double circuit connection from the existing Kilmarnock South 400kV substation towards Harker substation within NGET's licensed area via new 400kV substations at Killoch, New Cumnock North, Glenmuckloch and Dumfries North (note that Dumfries North 400kV Substation does not form part of the WCN2 project).

The current proposal is to uprate the existing Kilmarnock South – Coylton – New Cumnock (XY/WA) 275kV double circuit to 400kV operation in order to reduce the element of new 400 kV OHL build required whilst minimising need for additional circuits in the Kilmarnock South area. This requires establishment of new 400/275kV substations at Killoch (near existing Coylton) and New Cumnock North (near existing New Cumnock) in order to maintain supply to the existing 275kV network in Ayrshire and south west Scotland.

South and east of New Cumnock WCN2 proposes establishment of a new 400kV double circuit route via Glenmuckloch (being progressed independently of WCN2) and would be coordinated with the development of a new collector substation referred to as Dumfries North.

The majority of the WCN2 scheme when it is considered as its constituent parts is required to enable new onshore connections with circa 2.2GW of active offers across New Cumnock, Coylton, Glenmuckloch and the Dumfries area. The indicative WCN2 400kV route is shown in Figure 4 with the blue line indicating the proposed 400kV route.

It is prudent to include this as the indicative route shown below will pass "close" to Wyseby and therefore given SPT's licence obligations to develop an economic, efficient and coordinated system the connection of a WCN2 circuit, or circuits, into Wyseby is being considered as this may offer necessary connectivity between this proposed double circuit and the existing ZV Route and may provide additional system benefits, however, these have not been fully studied or realised yet. Wyseby 400kV substation does not form part of the scope of WCN2.

The system requirements and design parameters of the proposed scheme are summarised in Table 2.

Figure 4: Planned WCN2 Scheme (Indicative only, subject to project development).

Table 2: System Requirements and Design Parameters of Wyseby to ZV Route Reinforcements

System Design Table	Circuit/Project	Wyseby 400kV substation to ZV Route Reinforcements
Thermal and Fault Design	Existing Voltage (if applicable)	N/A
	New Voltage	400kV
	Existing Continuous Rating (if applicable)	N/A
	New Continuous Rating	5000A
	Existing Fault Rating (if applicable)	N/A
	New Fault Rating	50/55kA
ESO Dispatchable Services	Existing MVAR Rating (if applicable)	N/A
	New MVAR Rating (if applicable)	N/A
	Existing GVA Rating (if applicable)	N/A
	New GVA Rating	N/A
System Requirements	Present Demand (if applicable)	N/A
	2050 Future Demand	N/A
	Present Generation (if applicable)	N/A
	Future Generation Count	9
	Future Generation Capacity	1.9 GW
Initial Design Considerations	Limiting Factor	Land availability
	AIS / GIS	T.B.C.
	Busbar Design	Double Busbar
	Cable / OHL / Mixed	OHL
	SI	Interaction and integration to WCN2 reinforcement.

4 Optioneering

This section provides a description of the options that were considered to accommodate connection of renewable generation developments in the South West Scotland area. A summary of each option is described in Table 3. Also, the system requirements and design parameters for the considered options are summarised in Table 4.

4.1 Baseline – 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 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 System Operator Transmission Owner Code (STC) and associated Construction Planning Assumptions provided by NESO. The proposed works are identified as Enabling Works in the connection agreements relating to the projects in Table 1.

4.2 Option 1 – Double Tee off of ZV 400kV Circuits

Due to the 750MW initial contracted capacity from Wyseby Hill, it is necessary to connect the site into both sides of ZV Route to ensure adequate load balance between circuits. This option is to facilitate connection by a tee off arrangement to ZV Route on both sides of the 400kV OHL and extend this route to the new Wyseby 400kV substation by constructing a new 400kV L8 OHL.

At the location of this new terminal/tee off tower a small compound shall be required where the Elvanfoot - Gretna circuit can be extended via a section of Gas Insulated Busbar (GIB) or equivalent to enable the crossing under ZV Route.

The single line diagram in Figure 5 shows the initial proposed arrangement for the substation to accommodate the contracted connection to Wyseby Hill Energy Farm. The Point of Connection (**PoC**) shall be provided to the User via a new 400kV double busbar feeder bay.

This option is an economical solution for this particular connection, with an estimated total cost of £35.221m.

Since the Wyseby Hill Energy Farm project contracted with SPT further renewable generation applications have been received in this area. The solution as shown in Figure 5, i.e. the double tee off from ZV Route, is sufficient to enable these connections however the contracting of the developments as outlined in Table 1 has led to an increased number of 400kV double busbar bays to be installed and as such a larger substation platform to be established. This is shown in Figure 6 where Wyseby 400kV substation is sized at a 9-bay 400kV substation whereby 3 bays are for the ZV Route tee off circuits and a 400kV bus coupler and the remaining bays are for customer connection projects.

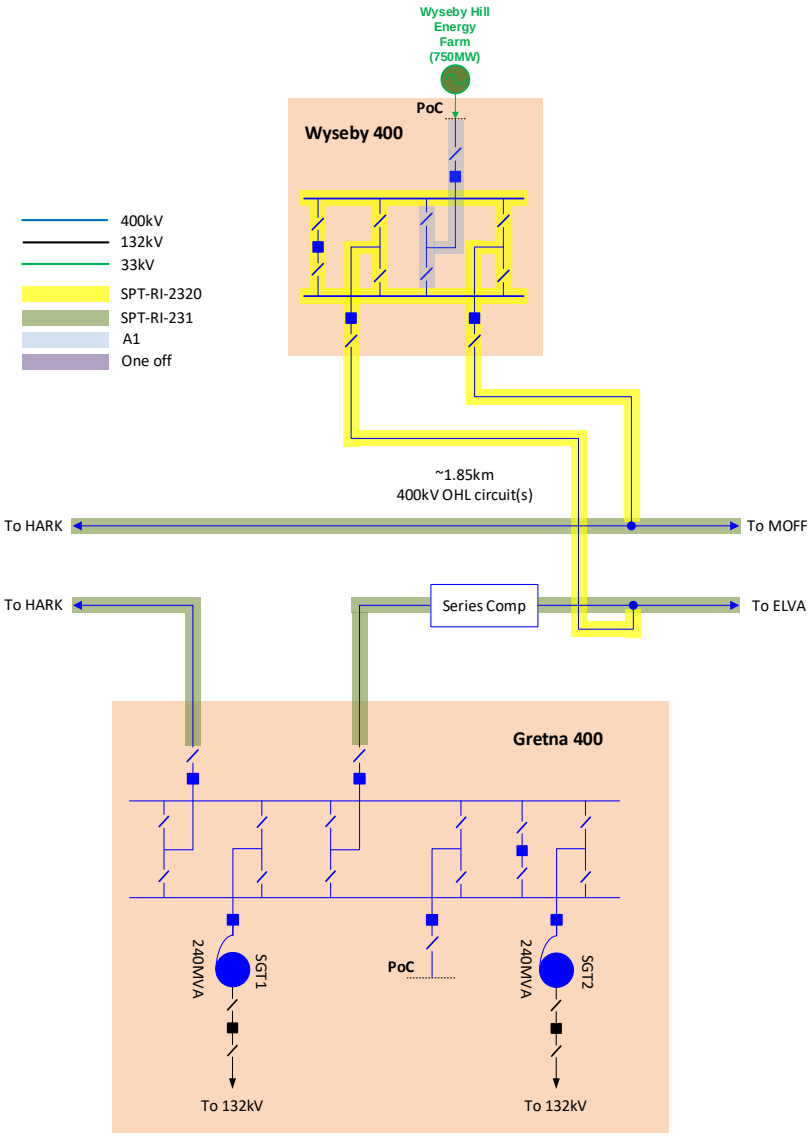

Figure 5: Wyseby 400kV substation Option 1 - Tee Off ZV circuits.

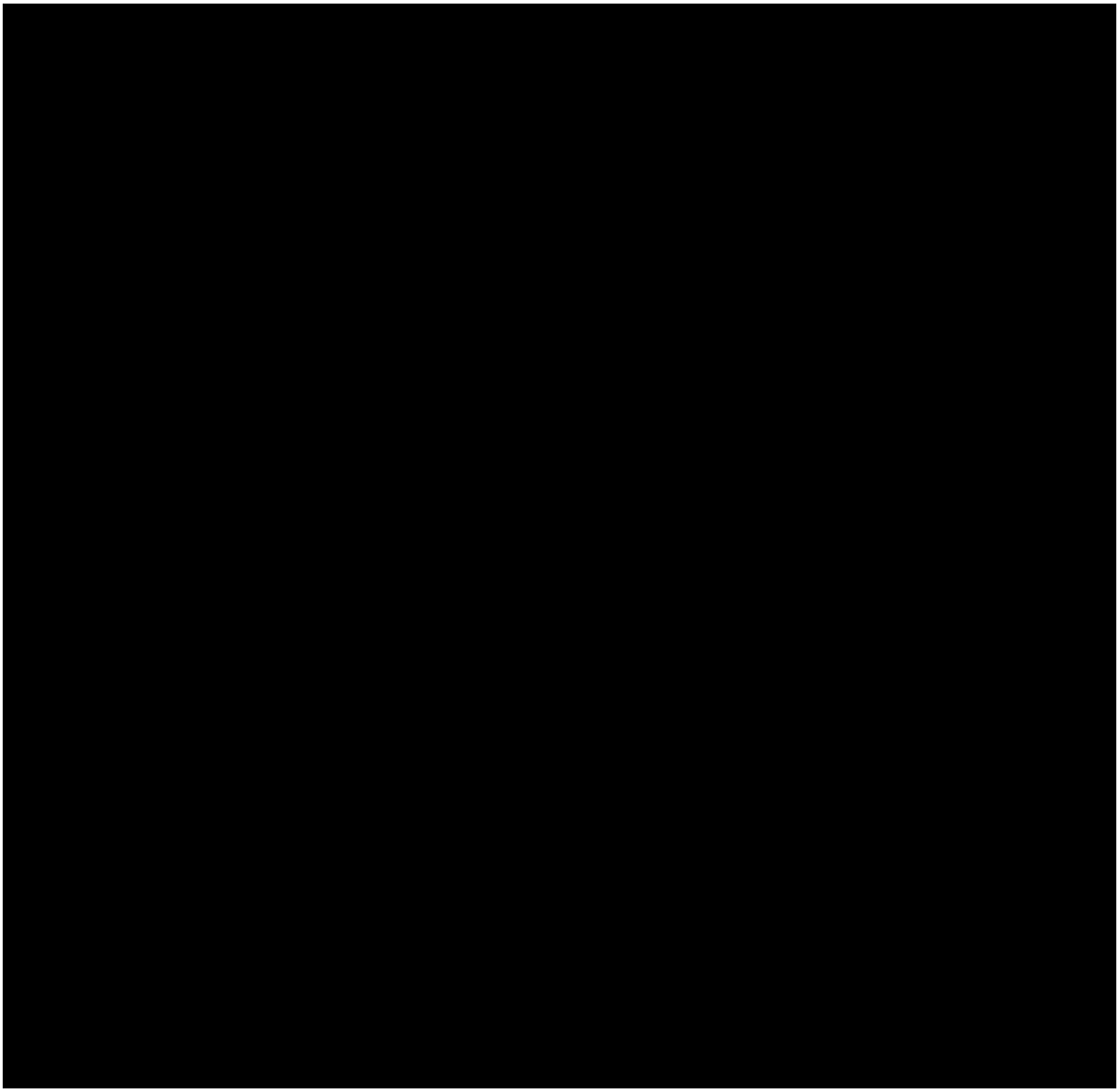

Figure 6: Wyseby 400kV Substation 9 Bay Arrangement.

4.3 Option 1a – New Wyseby 400kV Substation with double-circuit turn-in

As outlined in Section 3.2 there is the potential for the generation export from Wyseby substation to exceed 1800MW, which is the infrequent infeed loss risk value as set out in the NETS SQSS.

As part of the connection offers issued, the configuration of Wyseby has been amended and a full "turn in" of the ZV Route circuits is proposed in order to comply with the NETS SQSS requirements. This proposed arrangement is shown in Figure 7 to highlight expansion options being considered by SPT. Note that for simplicity the circuits to the connection projects have been removed to focus on Wyseby substation itself.

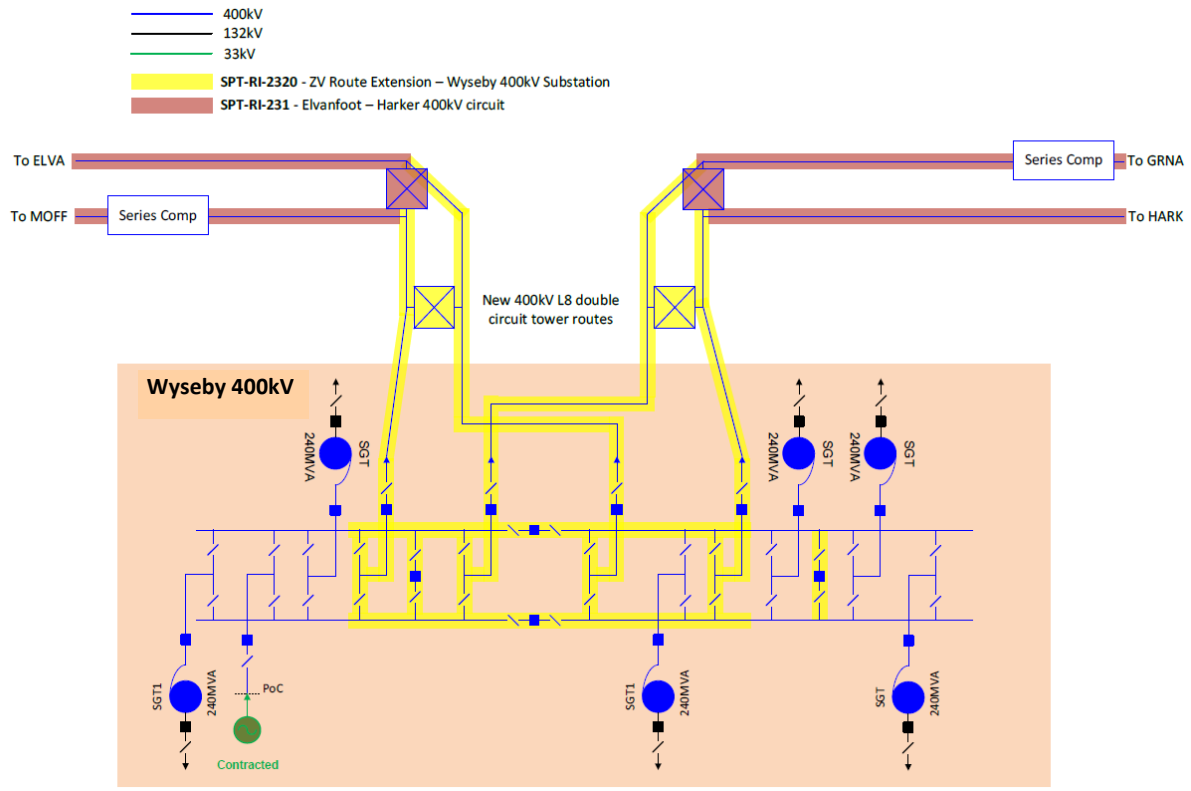

Figure 7: Wyseby 400kV substation Preferred Option 1a (i.e., Stage 1 - 15 bays arrangement and ZV route Turn-in/out).

In the configuration shown above the total number of bays when comparing to Option 1 as outlined in Section 4.2 has increased from 9 bays to 15 bays. This increase of six bays has come from the addition of the following:

- A second 400kV bus coupler
- Two 400kV bus sections
- Two additional 400kV bays for ZV Route circuits (two already included as part of Option 1)
- One additional 400kV bay for the connection triggering this option.

By turning in both sides of the existing ZV route, more generation capacity can be connected at the proposed site, hence the addition SGT included within the option versus Option 1.

Note that as per the NETS SQSS and the generation exceeding 1800MW SPT is required to provide a third circuit infeed into this substation. This has been achieved by breaking into the ZV Route circuits between Elvanfoot and Gretna substations.

As highlighted in Figure 7, this arrangement ensures the connection capability, operational flexibility and footprint can accommodate the contracted connections. This is therefore SPT's proposed option for the new Wyseby 400kV substation as part of this EJP. Subject to further design studies, it may be necessary to relocate the Gretna Series Compensation Equipment (SCE) currently housed at both Moffat and Gretna substations to this Wyseby substation location. Early development of Wyseby substation has accounted for these to be installed here.

Integration with WCN2 Project

The configuration shown in Figure 7 also gives SPT the ability to integrate the new 400kV double circuit proposed as part of the WCN2 project. Given the physical location of the Wyseby substation in relation to the existing electrical infrastructure and its proximity to the Scotland/England border, it presents SPT with the ability to potentially connect the WCN2 Route and ZV Route together. The detail and connectivity of this is still being developed, however it is considered prudent at this time to retain the ability to make these connections if/when required. As a result, the proposed 15 bay arrangement as shown in Figure 7 could reasonably increase by another 4 bays (19 bays in total) if it was determined that connecting the WCN2 circuits into Wyseby 400kV substation would provide a benefit to the operation of the system in this area. Note that Wyseby 400kV substation is not within the scope of WCN2.

4.4 Option 2 – 400kV OHL Connection to Gretna

When initially evaluating the Wyseby Hill Energy Farm (750MW) connection SPT considered a connection into Gretna 400kV substation. The solution would extend the site south and make space for seven new feeder bays, two new bus section bays and a second bus coupler. Figure 8 shows the proposed works in a single line diagram.

To provide a 400kV OHL solution to Wyseby Hill it was proposed to construct a new 400kV L8 tower route but only one side would be strung given that only a single circuit was required to the connection.
The construction of a double circuit OHL would present the opportunity to utilise the second side of the line for a future 400kV circuit into Gretna should the relevant driver present itself for increased export capacity across B6. Under this scenario the Wyseby 400kV substation could also be amended to include the installation of a circuit breaker to create a “single switch” substation arrangement (a double busbar substation could also be established if required).

This option may be applicable for a single Wyseby Hill Energy Farm connection; however, this does not present SPT with options to integrate other connections in the area therefore this did not present a solution in line with SPT’s licence obligations. This is particularly important considering the background of contracted connections (Table 1) and the ongoing development applications in the same area. Therefore, this option involves a double busbar substation similar to Option 1, the only difference (between this option and Option 1) is the location of the new substation as well as the Main Interconnected Transmission System (MITS) entry point, where this option creates:

- A new 400kV substation at/close to Wyseby Hill Energy Farm (Wyseby Hill 400kV),
- Connecting this new 400kV substation into an extended Gretna 400kV substation.

Note that in the single line diagram shown in Figure 8, space for an “East” 400kV double circuit has been left. Again, this is proposed to give SPT options as part of future growth for a double circuit out of Gretna.

All the works shaded in grey in Figure 8 denote works that would be considered upon the second side of the new OHL being brought into Gretna, specifically this is the feeder bays but also the second bus section and second bus coupler.

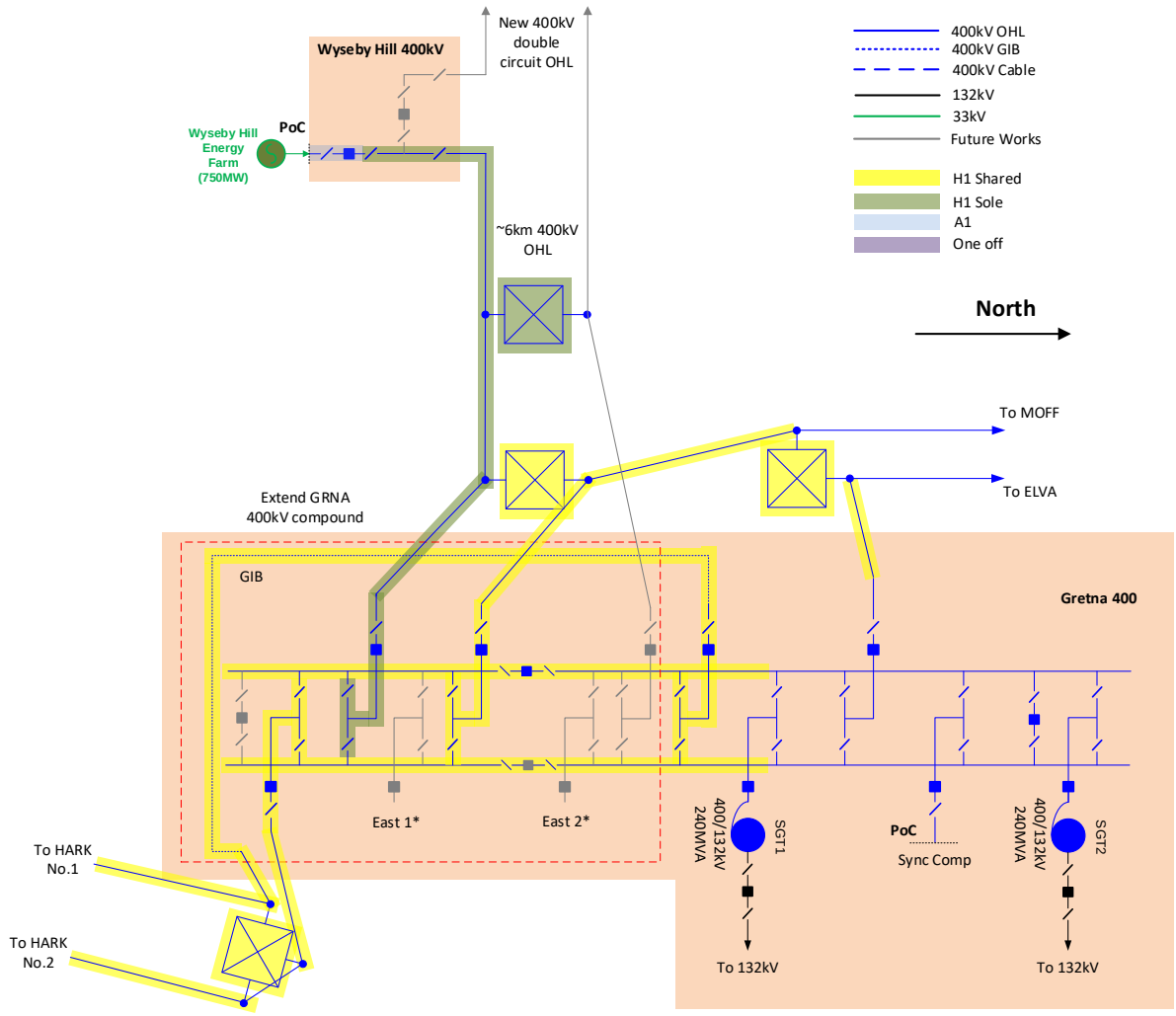

Figure 8: Wyseby 400kV substation Option 2 (i.e., Connection into Gretna 400kV S/S Using 400kV OHL).

The extension of Gretna substation to the south would require, but not be limited to, the following works:

OHL /Termination Works

- Amended OHL terminations and entries into Gretna Substation. The existing Harker's bay at Gretna, as shown in Figure 8 would be repurposed to create the new Gretna-Harker No.2. The existing terminal tower at Gretna may remain in place to accommodate the Moffat and Elvanfoot circuits now being turned into Gretna.
- Construction of a new terminal tower at Gretna. This tower shall turn in the new Moffat circuit with the other side of the tower being used for the new Gretna to Wyseby circuit.
- The installation of a new terminal tower for the new Gretna-Harker circuits. It is proposed to install this to the southwest of the new Gretna extension, enabling offline construction and minimising outage durations.
- Inclusion of GIB sections to connect from the terminal towers into the appropriate substation bays. This is proposed in preference to cable due to the ratings required given the transfer capability of ZV Route.

Substation Works

- Extend the existing platform south of the existing site into the neighbouring field. The platform extension is approximately 138m x 223m. This will require diversion of the existing road which serves as access to the site as well as access to two properties.
- Extension of the 400kV busbar system.
- Installation of one 400kV bus section circuit breaker (with space on the other busbar for a second)
- Installation of three new 400kV double busbar bays for Moffat-Gretna, Gretna-Harker No.1 and Gretna-Harker No.2
- Installation of a new 400kV double busbar bay for the Wyseby Hill connection.
- Installation of new control building.
- Associated civil works
- Associated protection and control works, including new feeder protections on the Moffat-Harker circuit which will become the Moffat-Gretna circuit.

The single line diagram in Figure 8 includes for the connection of two future feeder bays for a further double circuit to be connected. This is notionally labelled as “East 1” and “East 2”. There is no driver for this connection at the moment however given the boundary transfer requirements being forecast it is prudent to make allowance for future network connectivity options should future circuits be required in this area.

4.5 Option 3 – 400kV Cable Connection to Gretna

This option proposes similar works to those described in Section 4.4, however proposes connection of the Wyseby Hill Energy Farm via a 400kV cable circuit as opposed to overhead line. This solution considered at the time of the initial Wyseby Hill Energy Farm connection and is only applicable to that connection and not the others which have now become contracted.

This solution would see the Wyseby Hill Energy Farm connected into Gretna substation via a 400kV cable circuit. The connection of the 750MW from this connection would require SPT to “turn in” the existing Moffat to Harker 400kV circuit into Gretna to adequately balance the loading across the double circuit. These works are shown in Figure 9.

This option was considered but not taken forward as it did not offer the most economical solution. Due to the 400kV cable being installed a shunt reactor would also be required at the User’s end to compensate for the reactive power generated in the circuit.

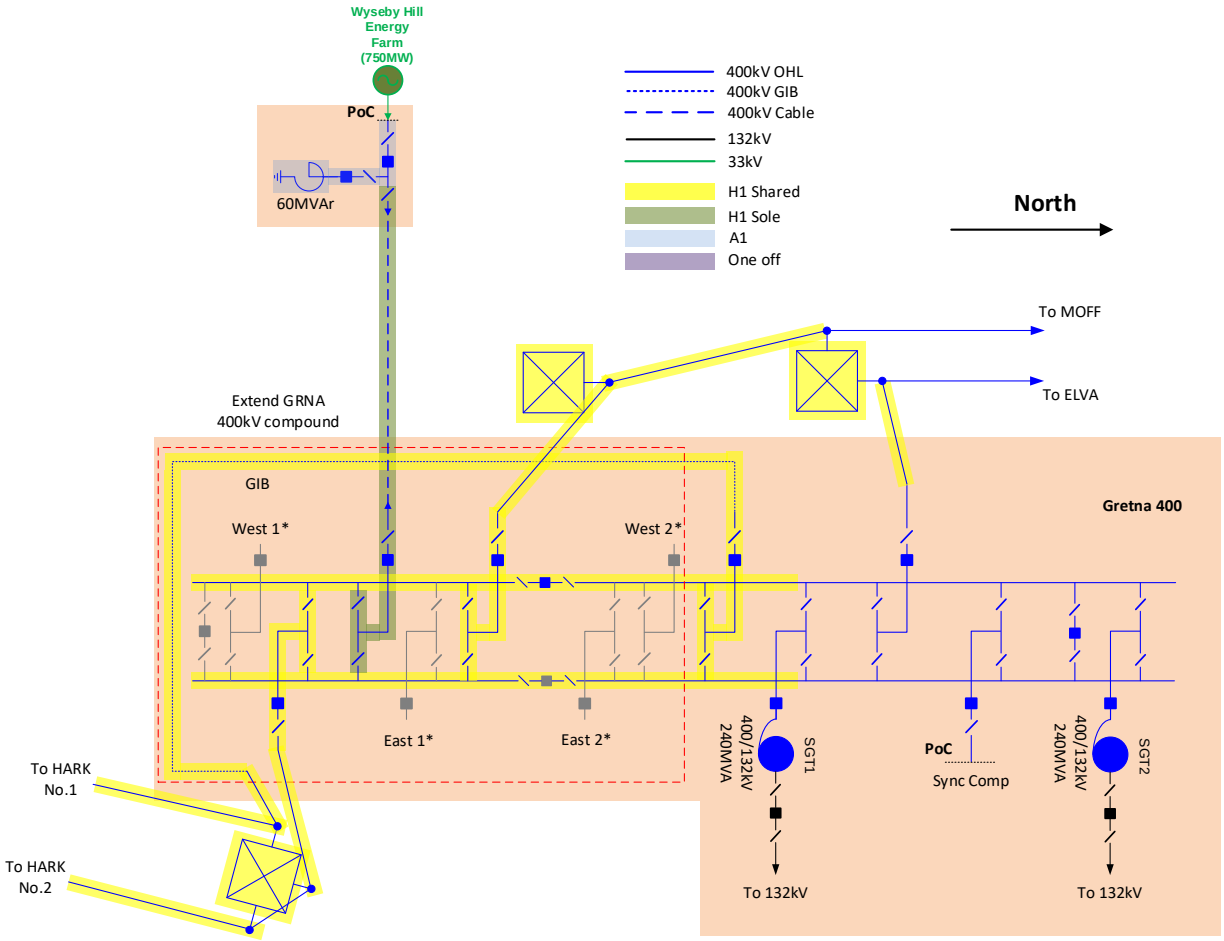

Figure 9: Wyseby 400kV substation Option 3 (i.e., Connection into Gretna 400kV S/S Using 400kV Cable).

The extension of Gretna substation to the south would require, but not be limited to, the following works:

OHL /Termination Works

- Amended OHL terminations and entries into Gretna Substation. The existing Harker's bay at Gretna, as shown in Figure 9 would be repurposed to create the new Gretna-Harker No.2. The existing terminal tower at Gretna may remain in place to accommodate the Moffat and Elvanfoot circuits now being turned into Gretna.
- The installation of a new terminal tower for the new Gretna-Harker circuits. In both Figure 8 and Figure 9 this is shown as being installed at the southwest corner of Gretna, enabling offline construction and minimising outage durations.
- Inclusion of GIB sections to connect from the terminal towers into the appropriate substation bays. This is proposed ahead of cable due to the ratings required given the transfer capability of ZV Route.

Substation Works

- Extend the existing platform south of the existing site into the neighbouring field. This will require diversion of the existing road which serves as access to the site as well as access to two properties.
- Extension of the 400kV busbar system.

- Installation of one 400kV bus section circuit breaker (with space on the other busbar for a second).
- Installation of three new 400kV double busbar bays for Moffat-Gretna, Gretna-Harker No.1 and Gretna-Harker No.2.
- Installation of a new 400kV double busbar bay for the Wyseby Hill connection.
- Installation of new control building.
- Associated civil works.
- Associated protection and control works, including new feeder protections on the Moffat-Harker circuit which will become the Moffat-Gretna circuit.

400kV Circuit to Wyseby Hill Energy Farm

It is proposed to install a 400kV cable circuit between Gretna substation the Wyseby Hill substation. A 2500mm^2 CU XLPE cable was proposed using one cable per phase between the two sites. The circuit is approximately 6km in length and utilises mostly a cross country route between the two sites. The reason for this is due to the pipeline infrastructure in the area and any road routes will require crossing this infrastructure. If an agreed cross-country route can be sought this would avoid this engineering difficulty. The indicative route is shown in the Appendix.

4.6 Option 4 – Moffat- Harker Circuit Turn In

In this option, a new 400kV double busbar substation would be created and tied into the Moffat-Harker 400kV circuit. This option considered establishing a new 400kV substation adjacent to the existing ZV Route to minimise new OHL infrastructure. For this reason, the solution proposes to establish a new 400kV substation, called Chapelknowe, and from here construct a new 400kV circuit to the Wyseby Hill Point of Connection (PoC) location. This arrangement would have created Moffat-Chapelknowe and Chapelknowe-Harker circuits. In terms of system operation this arrangement would have loaded 750MW from the connection onto one side of the ZV Route double circuit which would have created a large thermal unbalance. This would have also required reconfiguration works on the Moffat-Harker series compensation. As such this option was discounted. Figure 10 shows a single line diagram of this proposal.

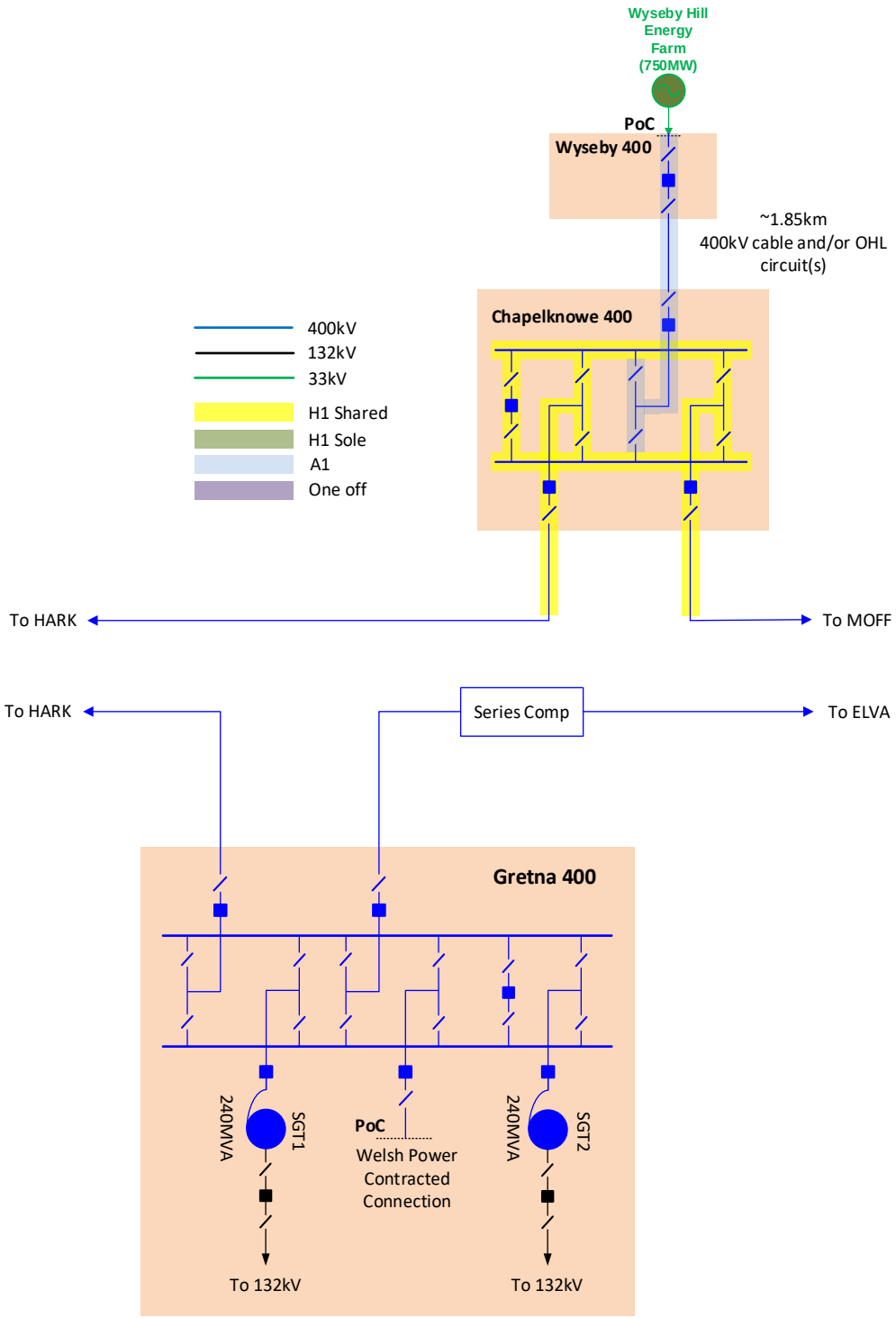

Figure 10 - Option 4 (Moffat/Harker Turn Into New Site).

Table 3: Summary of Considered Options

Options	Map or Single Line Diagram	Layout of all Route Works	Relevant Survey Works	Narrative Consenting Risks	Narrative Preferred Option	Narrative Rejection
Preferred – Option 1a: a new Wyseby 400kV substation connection to ZV circuits turn- in via OHL	Refer to Figure 7	N/A	N/A	Early engagement with landowners, environmental bodies and employing low bearing pressure ground vehicles and trackway where possible to minimise extents of stone tracks	Six options (including Do Nothing) have been reviewed in terms of scope feasibility, cost, delivery timescales, land requirements, system limitations and ensuring SQSS compliance with Option 1a enabling wider network capacity reinforcement.	N/A
Rejected – Baseline: Do Nothing / Delay	N/A	N/A	N/A	N/A	N/A	Inconsistent with SPT's various statutory duties and licence obligations.
Rejected – Option 1: Wyseby 400kV substation, Tee off arrangement to ZV circuits	Refer to Figure 5	N/A	N/A	N/A	N/A	This option offers no headroom for further development or generation connection within the same region. Also, the project's strategic goal will not be achieved as this option does not accommodate development of the 400kV corridor in WCN2 to connect into Wyseby.
Rejected – Option 2: Wyseby 400kV substation, connected to Gretna by overhead line	Refer to Figure 8	N/A	N/A	N/A	N/A	Similar to what is outlined in Option 1, this new option will still require the construction of a new 400kV double busbar substation to accommodate the contracted connections. The key distinction is that this site will be designated primarily for one specific developer. While a new 400kV double circuit can facilitate access to MITS, connecting over 1.9GW generation into Gretna substation requires substantial extension and operational adjustment of this already constrained substation, to maintain the compliance with SQSS.

Options	Map or Single Line Diagram	Layout of all Route Works	Relevant Survey Works	Narrative Consenting Risks	Narrative Preferred Option	Narrative Rejection
Rejected – Option 3: Wyseby 400kV substation, connected to Gretna by cable	Refer to Figure 9	N/A	N/A	N/A	N/A	The single cable can provide capacity for one contracted connection of 750MW and will not be able to accommodate all existing contracting requirements.
Rejected – Option 4: Wyseby 400kV substation, connected to the Moffat-Harker circuit along ZV	Refer to Figure 10					The connection of 750MW on to one side of ZV Route would limit the overall export capacity on ZV Route as the generation connecting here would back off transfers on the Moffat-Harker circuit. This connection would also have an adverse impact on the performance of the series compensation at Moffat due to the reduced circuit length.

Table 4: System Requirements and Design Parameters for the considered options

System Design Table	Circuit/Project	**Preferred – Option 1a:** ZV double circuits turn in/out Wyseby substation via OHL	**Rejected – Baseline:** Do Nothing / Delay	**Rejected – Option 1:** Wyseby Tee off ZV circuits at Gretna	**Rejected – Option 2/3:** 400kV circuits (either OHL or Cable) connection into Gretna	**Rejected – Option 4:** 400kV circuits connection to Moffat-Harker along ZV
Thermal and Fault Design	Existing Voltage (if applicable)	N/A	N/A	N/A	N/A	N/A
	New Voltage	400kV	N/A	400kV	400kV	400kV
	Existing Continuous Rating (if applicable)	N/A	N/A	N/A	N/A	N/A
	New Continuous Rating	5000A	N/A	5000A	5000A	5000A
	Existing Fault Rating (if applicable)	N/A	N/A	N/A	N/A	N/A
	New Fault Rating	50/55kA	N/A	50/55kA	50/55kA	50/55kA
ESO Dispatchable Services	Existing MVAR Rating (if applicable)	N/A	N/A	N/A	N/A	N/A
	New MVAR Rating (if applicable)	N/A	N/A	N/A	N/A	N/A
	Existing GVA Rating (if applicable)	N/A	N/A	N/A	N/A	N/A
	New GVA Rating	N/A	N/A	N/A	N/A	N/A
System Requirements	Present Demand (if applicable)	N/A	N/A	N/A	N/A	N/A
	2050 Future Demand	N/A	N/A	N/A	N/A	N/A
	Present Generation (if applicable)	N/A	N/A	N/A	N/A	N/A
	Future Generation Count	9	9	9	9	9
	Future Generation Capacity	1.9GW	1.9GW	1.9GW	1.9GW	1.9GW
Initial Design Considerations	Limiting Factor	Land availability	N/A	An economical option for one specific connection but does not enable further developments in the region.	Connecting all contracted generation exceeding 1900MW into Gretna poses a risk to compliance with SQSS Planning Standards, as the infrequent loss of infeed should be limited to 1800 MW following a secured event.	Connecting substantial generation into either single circuit of ZV will cause the power flow imbalance along this circuit and reduce the boundary transfer capacity.

System Design Table	Circuit/Project	**Preferred – Option 1a:** ZV double circuits turn in/out Wyseby substation via OHL	**Rejected – Baseline:** Do Nothing / Delay	**Rejected – Option 1:** Wyseby Tee off ZV circuits at Gretna	**Rejected – Option 2/3:** 400kV circuits (either OHL or Cable) connection into Gretna	**Rejected – Option 4:** 400kV circuits connection to Moffat-Harker along ZV
					Additionally, the delivery risks such as difficulties in expanding Gretna, costs implications must be considered.	
	AIS/ GIS	T.B.C	N/A	T.B.C	T.B.C	T.B.C
	Busbar Design	Double busbar	N/A	Double busbar	Double busbar	Double busbar
	Cable/ OHL/ Mixed	OHL	N/A	OHL	Cable	OHL
	SI	- site footprint can accommodate feeder bay / busbars for future generation connections. - enable the full connection with planned WCN2 400kV circuit across the border.	N/A	- limited headroom for further generation connection on the ZV circuits.	- limited headroom for further generation connection on the ZV circuits.	- limited headroom for further generation connection on the ZV circuits.

4.7 Selected Option – ZV circuits turn into Wyseby 400kV Substation (Option 1a)

As discussed above, while the Wyseby 400kV substation was triggered by one particular generation connection request, it is necessary to coordinate such a reinforcement in an economic and efficient manner.

Both air-insulated switchgear (AIS) and gas-insulated switchgear (GIS) may meet the objectives of the project. The options for AIS and GIS will be developed while continuing to optimise and assess site locations and conditions, and the routing of new overhead line infrastructure. This will include considerations of carbon emissions, environmental footprint, climate resilience, supply chain factors, and the flexibility for future expansion.

4.8 Whole System Outcomes

Our optioneering approach has identified 'Whole System' interactions with other electricity network in the area, i.e., SP Distribution (SPD), in the development of our proposed solution and has considered the appropriate 'Whole System' outcome. This is with consideration that it is not expected that there is any future requirement for SP Distribution (SPD) connections at this location, as the DNO in the area.

5 Proposed Works & Associated Cost

5.1 Project Summary

As discussed above, the most appropriate option to enable economic, efficient, and coordinated connection of recent generation developments in Wyseby Hill and Gretna area of the southwest of Scotland is to establish a new Wyseby 400kV substation and install approximately 5.54km of 400kV OHL from Wyseby to ZV route at Gretna.

5.2 Stage 1

In this delivery stage, the entire Wyseby 400kV substation platform will be established to provide a point of connection for the double circuit OHL to ZV route as well as one feeder bay to collect one generator, rated at 750MW.

However, the size of the substation will accommodate future development with the capacity to accommodate 24 feeder bays and 4 busbar sections.

The proposed electrical layout of Wyseby substation for Stage 1 can be found in Figure 6. The associated works in this stage are summarised in the following: -

Pre-Engineering Works

The following list is indicative based on previous experience of such sites and as such should not be read as definitive. 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 to extend ZV circuits to connect to Wyseby.
- Transport Survey to assess the access of the new Equipment.
- Environmental Study.

Wyseby 400kV substation[2]

As shown in Figure 6 in the previous section, the works at Wyseby 400kV substation shall include:

- Establishment of new 400kV double busbar substation at Wyseby
- One double busbar feeder bay for the new Wyseby-Harker circuit.
- One double busbar feeder bay for the new Wyseby-Moffat circuit.
- One double busbar feeder bay for the new Wyseby-Gretna circuit.
- One double busbar feeder bay for the new Wyseby-Elvanfoot circuit.
- Installation of two 400kV bus couplers.
- Installation of two 400kV bus sections.
- Relocation of the Gretna SCE to Wyseby and associated modification of the Moffat SCE. N.B. these works shall be identified via system studies.
- All associated protection and control works.
- All associated environmental and civil works.
- Miscellaneous works.

The civil engineering works associated with stage 1 of this element of the project are summarised in the following bullet points. These works include layout for the full 400kV substation, including space for all future potential bays, and development of the interim 400kV substation for Stage 1.

- The design of foundations and structures necessary to construct the site civil platform in the Wyseby substation area.
- The design and construction of foundations and structures necessary to support the equipment within the substation area.
- Enabling works to achieve the above requirements to facilitate temporary and/or enduring accesses for construction, operation, and maintenance purposes.

Wyseby to ZV 400kV OHL

The overhead line works are summarised as follows:

- Turn in in both sides of ZV Route (Moffat - Harker) onto new L8 400kV OHL circuit route towards Wyseby 400kV substation.
- From ZV Route to Wyseby 400kV, two new 400kV L8 double circuit tower routes shall be constructed. They shall be strung with twin Curlew HTLS conductor operating at 190℃ or equivalent. This conductor is in line with the SPT-RI-231 works.
- All associated environmental and civil works.
- Miscellaneous works.

[2] In line with SPT-RI-2320, July,2024.

Table 5: Rating of Twin Curlew HTLS Conductor at 400kV and Operating at 190°C [3].

Season / State	Amps	MVA
Winter Pre Fault	3900	2700
Winter Post Fault	4650	3220
Spring/Autumn Pre Fault	3840	2660
Spring/Autumn Post Fault	4570	3170
Summer Pre Fault	3740	2590
Summer Post Fault	4460	3090

5.2.1 Estimated Total Project Cost (Stage 1 only)

A Business Plan provision and estimated cost of the project is indicated in Table 6. Costs provided include direct, indirect and risk contingency costs.

Table 6: Project Cost Estimate Breakdown

Item	Description	[redacted]
1	Wyseby 400kV Substation	
2	Overhead Line	
3	Protection & Control	
4	Risk	
Total		

Expenditure incidence is summarised in Table 7:

Table 7: Summary of Expenditure Incidence

Energisation Year	Yr. 2027: CAPEX	Yr. 2028: CAPEX	Yr. 2029: CAPEX	Yr. 2030: CAPEX	Yr. 2031: CAPEX	RIIO-T3 Total: CAPEX	RIIO-T4 Total: CAPEX	Total: CAPEX
2031	£0.37m	£0.30m	£3.38m	£23.39m	£28.10m	£55.54m	£11.21m	£66.99m

5.2.2 Regulatory Outputs

The indicative primary asset outputs are identified in Table 8:

Table 8: Indictive Primary Asset Outputs

Asset Category	Asset Sub-Category Primary	Voltage	Forecast Additions[4]	Forecast Disposal
Circuit Breaker	CB	400kV	9[5] units	-
Substation Platform	Platform Creation	400kV	1 units	-
Overhead Tower Line	OHL (Tower Line) Conductor	400kV	7.4km (2 x Double Circuits 1.85km)	-

3 In line with the SPT-RI-231.
4 Forecast Additions are indicative pending further detail design.
5 8 bays are attributed to SPT-RI-2320 and one to the connection project triggering the development of Wyseby.

Overhead Tower Line	Tower	400kV	4 units	-
Overhead Line Fittings	Fittings	400kV	8 units	-

5.3 Stage 2

Currently Stage 2 and Stage 3 are subject to the completion of ongoing planning for future network needs and as such may change in in terms of delivery and physical scope. Stage 2 is the development for the contracted connections according to their connection dates and Stage 3 includes the integration of WCN2, which is at early stages of development.

Enabling works to achieve the above requirements to facilitate temporary and/or enduring accesses for construction, operation, and maintenance purposes.

5.4 Stage 3

When the proposed WCN2 circuits are constructed in 2036, the stage 3 focuses on the integration of the new circuits into the 400kV double busbar substation at Wyseby substation as indicated in the future plan in Figure 1.

The associated works in this stage are summarised in the following -

Wyseby 400kV substation
The full Wyseby 400kV double busbar substation shall be configured as follows:

- 4 x 400kV bays for ZV Route turn in/out.
- 4 x 400kV bays for WCN2 Route turn in/out.
- 8 x 400kV bays for individual generators
- 2 x 400kV bus couplers
- 2 x 400kV bus sections
- 4 x spare bays' space provision (2 at each end of the substation)

The civil engineering works associated with the Stage 3 elements of works should be largely already accommodated given the substation platform will be designed to accommodate the full 24-bay substation.

6 Environmental and Consents Works

Section 37 consent will be sought from the Scottish Ministers to install the new double circuit L8 400kV OHL. Deemed planning permission is also being sought for the 400kV OHL and the proposed Wyseby 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 will be 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 Deliverability

We have applied SPT 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 these works. We have assigned a dedicated Project Manager to the works at every stage who is responsible for overall delivery of the scope and is the primary point of contact for all stakeholders.

7.1 Delivery Schedule

A standard approach has been applied to the planning phase of these works and that will continue for the reporting and the application of processes and controls throughout the lifecycle. Table 3 summarises the key milestones within the delivery schedule for Stage 1 of this project. Complete detail on the energisation dates and delivery schedules for the proposed scheme can be found in Appendix B.

Table 3 – Summary of Key Milestones within the Project Delivery Schedule (Stage 1 only)

Item	Project Milestone	Estimated Completion Date
1	Section 37 Submission	June 2028
2	Earthworks ITT	October 2028
3	OHL ITT	October 2028
4	Conclude Missives	July 2029
5	Section 37 Award Date	July 2029
6	OHL Access Contract Award	July 2029
7	Civil Earthworks Contract Award	July 2029
8	Substation Civil Works Commencement	May 2030
9	OHL Access Works	May 2031
10	Commissioning	October 2031

SP Energy Networks (SPEN) for its procurement process follows a generic global process (INS 00.08.04) for supplier pre-qualification, product technical assessment, manufacturing factory capability assessment and quality audit. The SPEN's equipment approval procedure is to:

- identify and select candidate equipment.

- ensuring the candidate equipment is assessed to meet the specific requirements of SPEN.
- ensuring a structured and consistent approach is adopted for the approval of candidate equipment prior to energisation.
- Ensuring no equipment is installed on SPEN's network without first having been examined in accordance with the procedure and issued with a formal internal approval.

ASSET-02-002 specifies the SPEN's approval process inclusive of assessment scope and business processes for various equipment.

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.

7.2 Risk and Mitigation

A Project Risk Register was generated collaboratively during the initial project kick-off meeting to identify any risks, which if realised, could result in deviation from the 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 scheme risks are as follows:

Table 10 - Main Scheme Risks and Mitigation Plans

Risk Title	Risk Description	Mitigation Plan
Planning Consent	Delay in submission of Section 37 application and receiving approvals from Scottish Ministers may delay the project delivery plans.	Regular meetings will be held with developers and/or landowners to satisfy the stakeholders requirements, manage an in-time submission of Section 37 application and frequent follow ups with Scottish Ministers to ensure receiving the approvals on time.
Compulsory Purchase Order (CPO)	CPO being sought due to being unable to secure voluntary land rights for 400kV substation platform.	Regular meetings will be held with SPEN's planning and permission team to ensure SPEN's OHL route principles have been met. Continued engagement with relevant landowners.

7.3 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:

7.3.1 Quality Requirements During Project Development

Any risk or opportunity that may affect the quality of the product are detailed in the Project Risk Register. The suppliers of main equipment may also receive a Factory Acceptance Test Inspection when the asset is being built.

7.3.2 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.

7.3.3 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.

7.3.4 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.

7.4 Environmental Sustainability

IMS-01-001 encompasses all activities undertaken within and in support of SP Energy Networks three Licences. This includes operational and business support functions concerned with management of SP Transmission, SP Distribution and associated regulatory and commercial interfaces, products, services, and their associated environmental, social, and economic impacts. The policy makes the following commitments which shall be respected in any works associated with this scheme.

SP Energy Networks will incorporate environmental, social, and economic issues into our business decision-making processes, ensuring compliance with or improvement upon legislative, industry, regulatory and other compliance obligations. We will deliver this by being innovative and demonstrating leadership on the issues which are important to us and our stakeholders, and will:

- Ensure the reliability and availability of our Transmission and Distribution network whilst creating value and delivering competitiveness by increasing efficiency and minimising losses.
- Reduce greenhouse gas emissions in line with our Net Zero Science Based GHG target, which is a target of 90% reduction in GHG emissions by 2035 (TBC) from a 2018/19 baseline.
- Integrate climate change adaptation requirements into our asset management and operations processes to support business resilience and reduce the length and time of service interruptions.

- Consider whole life cycle impacts to reduce our use of resources to sustainable levels, improve the efficiency of our use of energy and water and aim for zero waste.
- Improve land, air and watercourse quality by preventing pollution and contamination and protecting and enhancing biodiversity in our network areas.
- Improve our service to local communities, supporting their economic and social development, protecting vulnerable customers, and respecting human rights.

ENV-04-014 gives specific guidance on the management of incidents with environmental consequence, or potential for environmental consequences, over and above the general requirements for the management of incidents.

The proposed design solution is also resilient to future climate change risks, such as substation flooding or potential faults from vegetation along the route.

SPEN policy to eliminate risk of substation flooding entails:

- Substations shall be designed such that there is no loss of supply or damage to strategic equipment during a 0.1% annual exceedance probability (AEP) flood event. Access routes to the substation shall also be considered to ensure access will be available during flood conditions and consideration of staff access to the key plant and buildings during the 0.1% annual flood event.
- In those instances where there is a compelling reason to locate a substation inside this zone and this is accepted by SPEN Network Planning & Regulation the substation design shall eliminate or mitigate against the risk of such a flood impacting the operation of the substation (access requirements, loss of supply, or damage to equipment).
- The 400kV substation platforms shall be constructed at a minimum level of 600mm above the 0.1% designed flood level, the 600mm freeboard allows for uncertainties in data and modelling. The designed flood level shall include an allowance for climate change for a 50-year design life, in accordance with the requirements of the relevant national environment agency. Where climate change guidance is not available then a minimum of 200mm shall be applied. The flood design should consider Pluvial, Fluvial, Coastal and Reservoir flooding, as well as combinations of these.

SUB-01-018 gives detailed specific guidance on SPEN's substation flood resilience policy.

Also, SPEN policy to reduce the number of vegetation related OHL faults entails:

In SPEN to reduce the number of vegetation related OHL faults, the route will be surveyed, consented, and cut on a per kilometre basis. The cutting specification entails:

- Falling distance plus 5m (i.e., Vicinity Zone) to the conductor and maintain 5 years clear from that distance.
- Clearance as 5.3m to be achieved from conductor positioned at 45° blowout and maximum sag condition. Maintain 5 years clear from that distance.

- All vegetation directly below the OHL with the potential to breach the Vicinity Zone before the next cut cycle shall be removed.
- Hedgerows shall be maintained. Species identified with no threat to breach the Vicinity Zone at any point in the future shall continue to be managed as part of the 3-year vegetation management programme.

- Tower bases shall be kept free of all scrub to a distance of 5m from the base.

OHL-03-080 gives detailed specification for OHL vegetation management in SPEN.

Additionally, the preferred OHL route for the project needs to be identified after extensive evaluation of the length of route, biodiversity and geological conservation, landscape, and visual amenity (including recreation and tourism), cultural heritage, land use, forestry, and flood risk.

If routing the OHLs in areas of forestry the guideline is to -

- Avoid areas of landscape sensitivity;
- Not follow the line of sight of important views;
- Be kept in valleys and depressions;
- Not divide a hill in two similar parts where it crosses over a summit;
- Cross skylines or ridges where they dip to a low point;
- Follow alignments diagonal to the contour as far as possible, and;
- Vary in the alignment to reflect the landform by rising in hollows and descending on ridges.

The overall project design objective is to minimise the extent of felling required and woodland areas and individual trees are to be avoided where possible during the routeing phase. Where routeing through woodland has been unavoidable, a 'wayleave' corridor is required for safety reasons to ensure that trees do not fall onto the line and for health and safety of forestry operatives. SPEN has statutory powers to control tree clearance within the wayleave corridor. Where possible the design of the new OHLs and associated infrastructure must be sought to avoid/minimise felling where possible, when balancing with other technical and environmental objectives.

7.5 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 will engage with statutory consultees associated with the planning application for these works - the Local Authority, SEPA and Nature Scot - and the third-party landowner.

Due to the location and nature of this project, no particular sensitivities or community impact issues have been identified, but a general level of interest from local representatives has been noted and we will continue to engage with them throughout the project. Stakeholder engagement to date has informed the details of the construction and permanent drainage details for the works.

8 Eligibility for Competition

Under the RIIO-T3 Business Plan Guidance, Ofgem has requested that projects that are above £50m and £100m should be flagged as being eligible for being suitable for early and late competition respectively. This project is above the early competition threshold, however, is not suitable due to:

- A number of new connections projects are dependent on the completion date, therefore delays through any project tender exercise will delay these projects.
- Works on existing ZV Route are not separable as integral to the existing circuits. These works would need to be removed from scope of any competed works.

9 Conclusion

This EJP demonstrates the need to establish the new Wyseby 400kV substation and install two 400kV double circuit OHLs between the proposed Wyseby 400kV substation and ZV route. This reinforcement scheme primarily serves as enabling work required for connection of 1.5GW of contracted renewable generation and headroom for the active development around Wyseby Hill area, South West Scotland.

Construction of the proposed Wyseby 400kV substation can potentially form part of a new 400kV double circuit corridor between Scotland and the North of England (with the project reference WCN2).

The main conclusions of this submission are:

- It is necessary to invest in transmission infrastructure at Wyseby 400kV Substation to enable the connection of at least 1.5GW of contracted renewable generation, this having been identified as the most economic and efficient option.
- The staging of the construction of the proposed Wyseby 400kV substation has been established to reflect the growing needs in the area and enable the timely and efficient connection of contracted generation as well as future network needs i.e. the expansion of the 400kV system.
- The proposed staging approach offers flexibility for future local connections.
- The proposed reinforcement scheme plays a vital role in reaching legislated net zero targets.

We ask for Ofgem's approval of need as laid out in the paper, with an expectation that a cost assessment will be made within the RIIO-T3 period under the Load Related Reopener at an appropriate time.

10 Appendices

Appendix A – Maps and Diagrams

Appendix B – Project Delivery Schedule

Appendix A: Maps and Diagrams

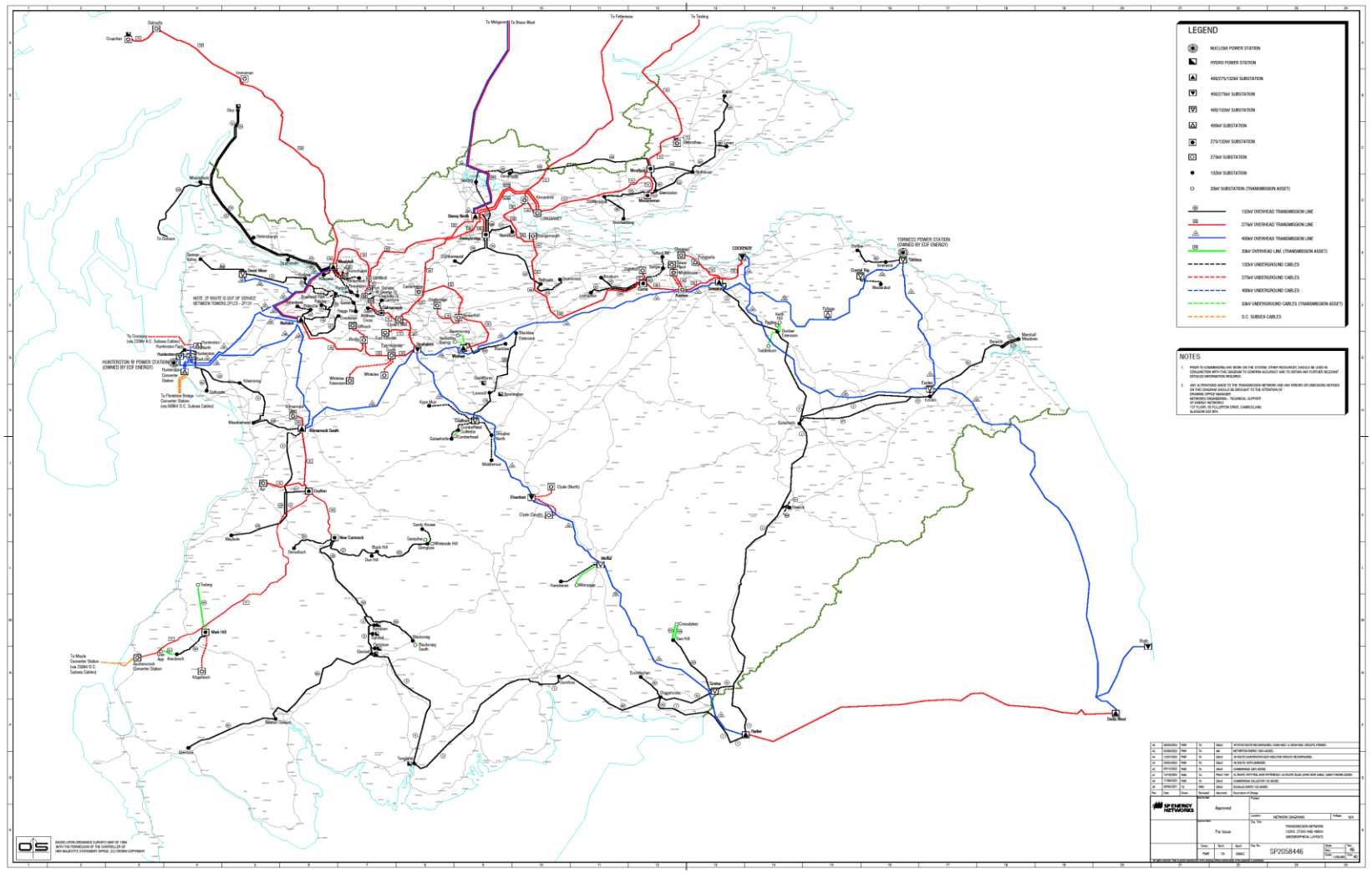

Figure A-1: Networks Diagram of the existing SPT system - Geographical Layout

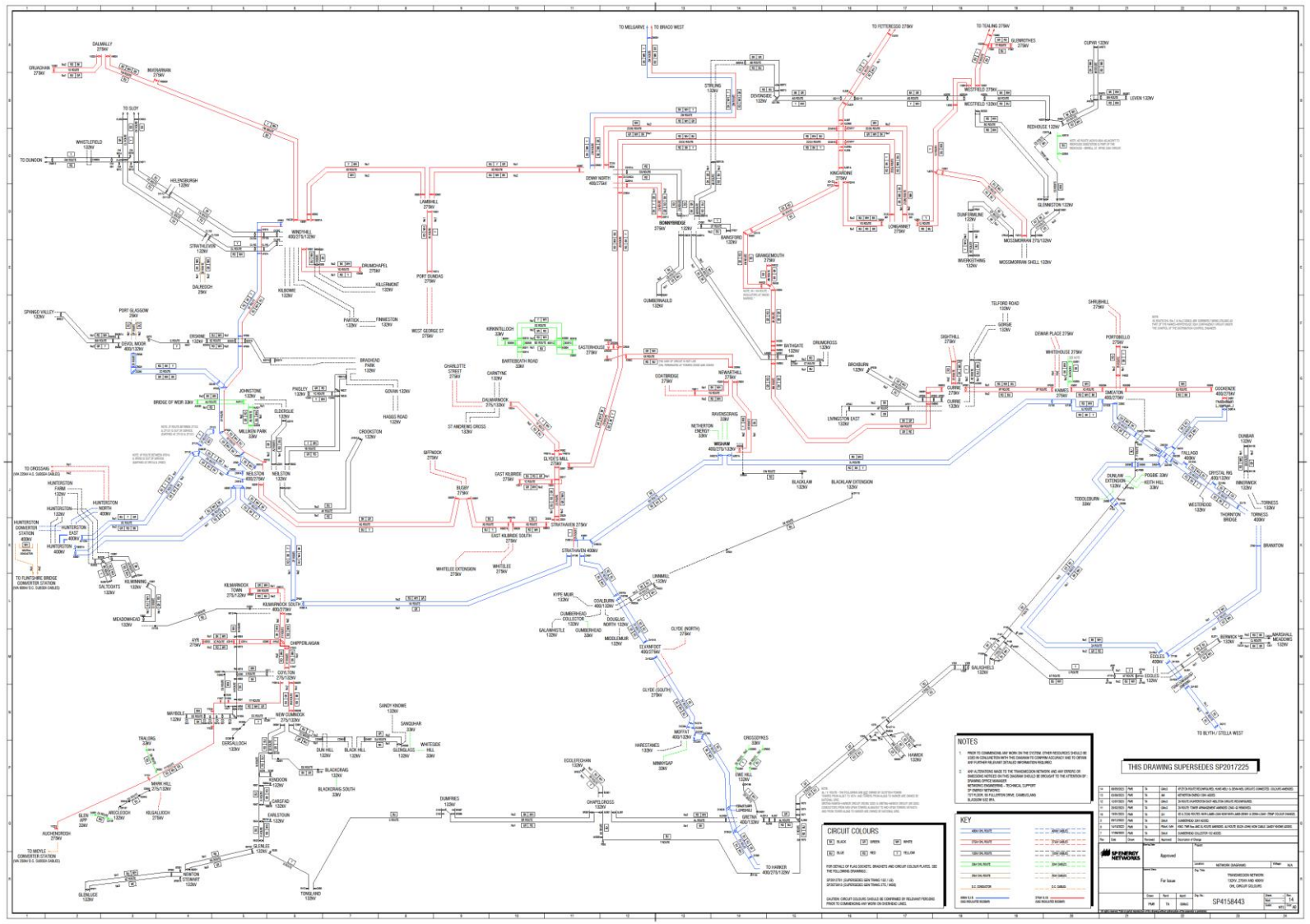

Figure A-2: Networks Diagram of the existing SPT systems – Single Line Diagram

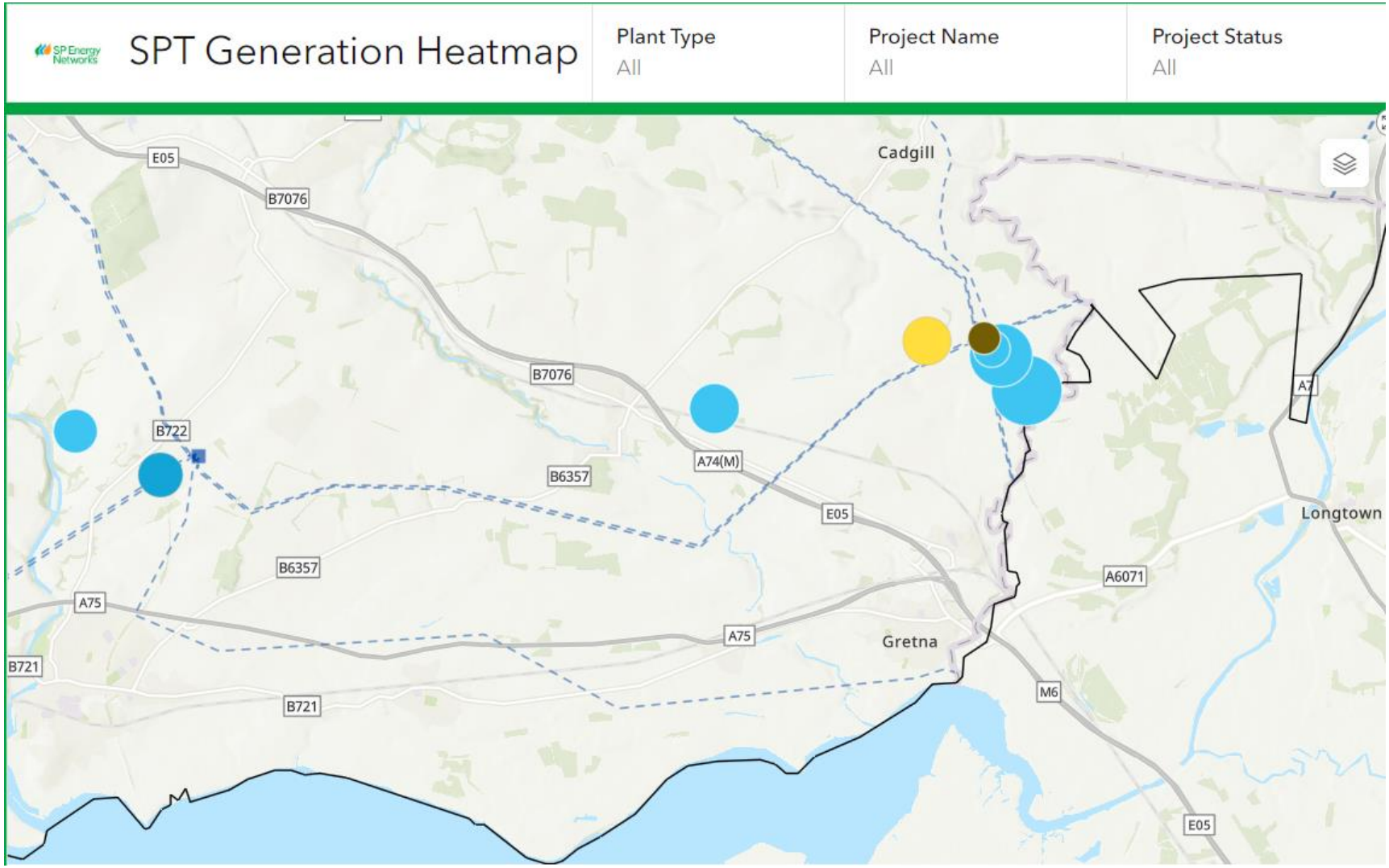

Figure A-3: Currently Connected Generation Extracted from Transmission Generation Heat Map*

* The Energy Storage Systems represent the Battery Energy Storage Systems technology (commonly known as BESS technology).

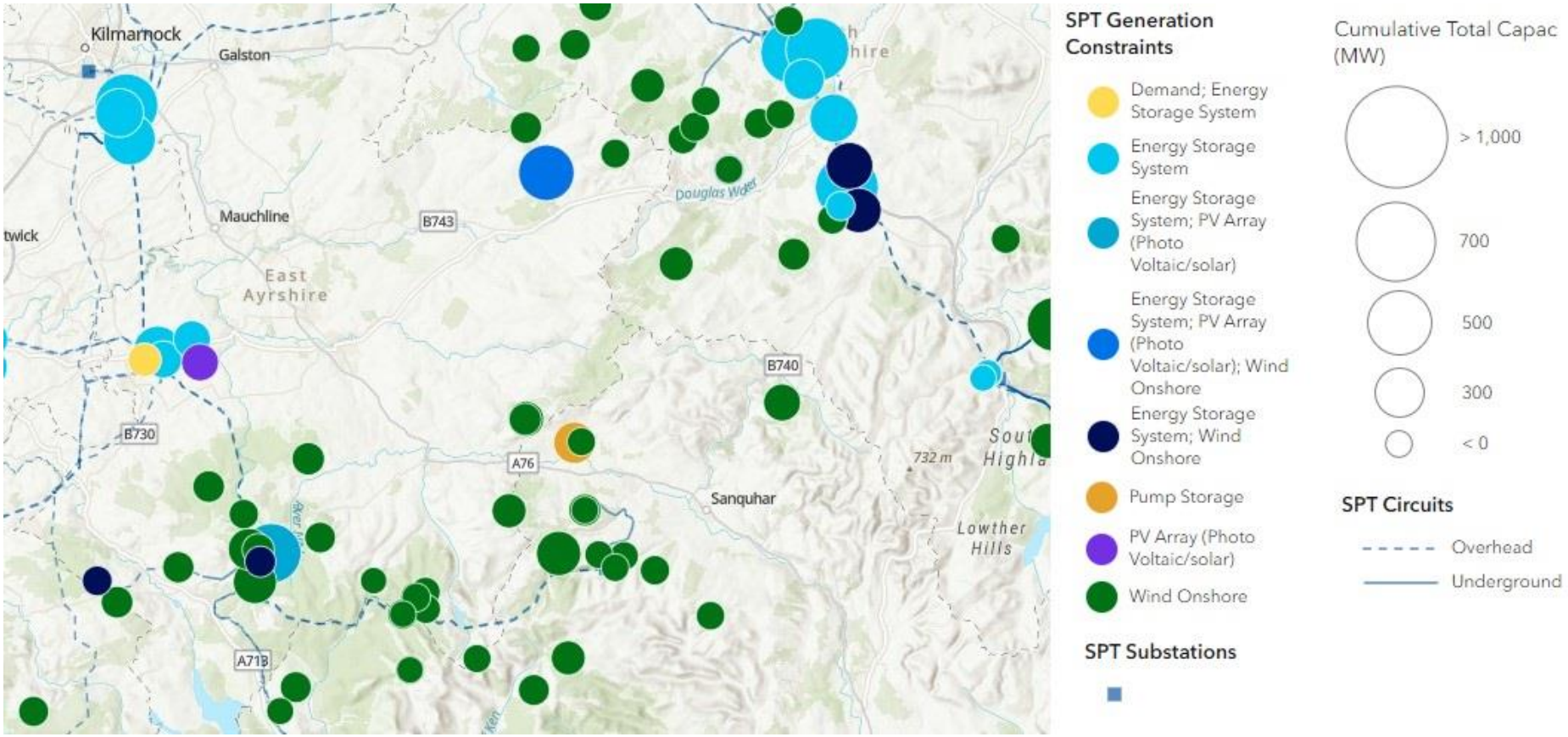

Figure A-4: Contracted and Connected Generation Extracted from Transmission Generation Heat Map*

* The Energy Storage Systems represent the Battery Energy Storage Systems technology (commonly known as BESS technology).

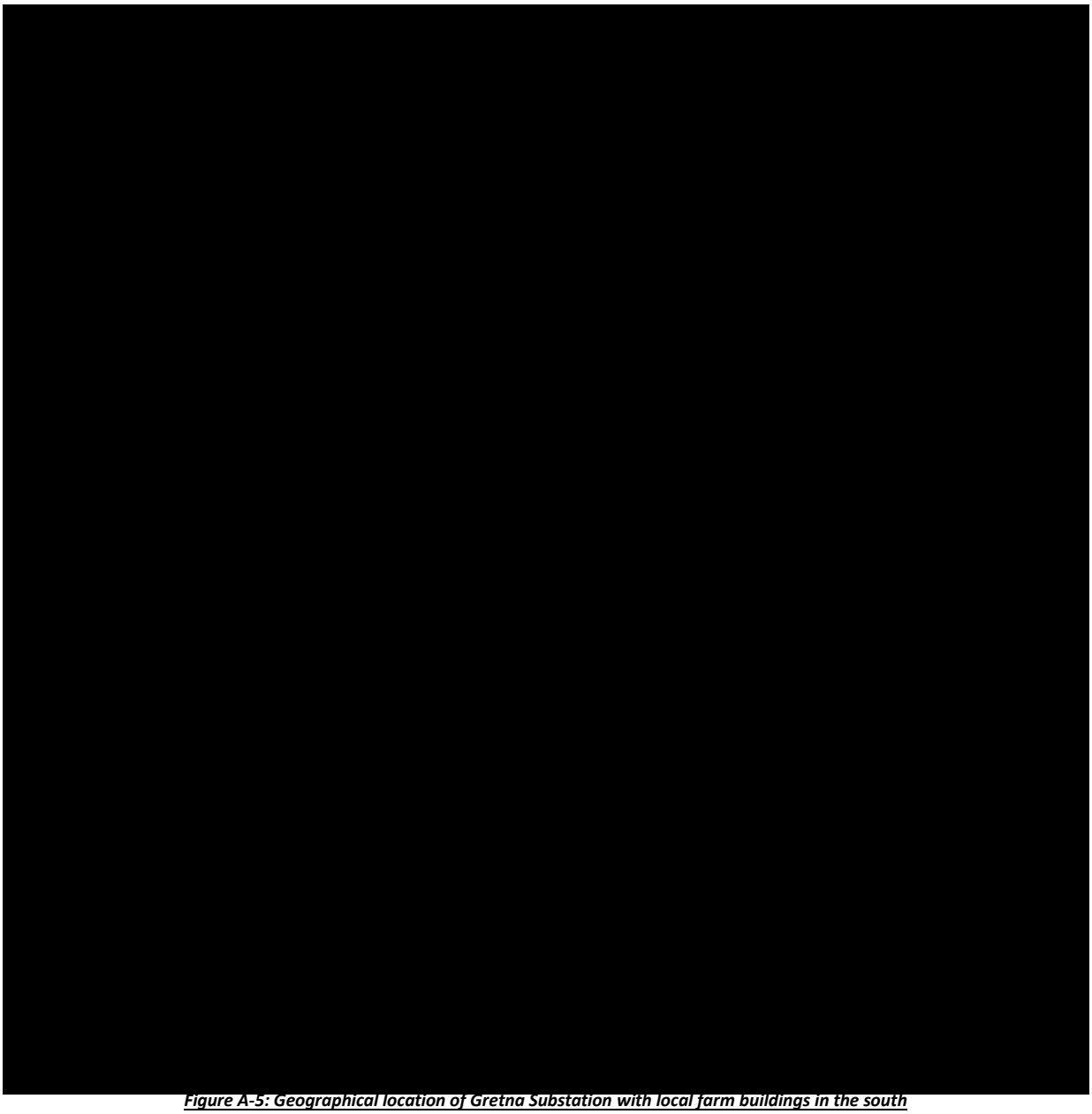

Figure A-5: Geographical location of Gretna Substation with local farm buildings in the south

Figure A-6: Indicative 400kV Double Circuit Route Between ZV346R and Wyseby 400kV Substation

Figure A-7: Indicative 400kV Cable Route Between Gretna and Wyseby Hill