

Eastern Green Link 4: Scottish Onshore Scheme

Volume 1: Non-Technical Summary

December 2025



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1. Non-Technical Summary

1.1 Introduction

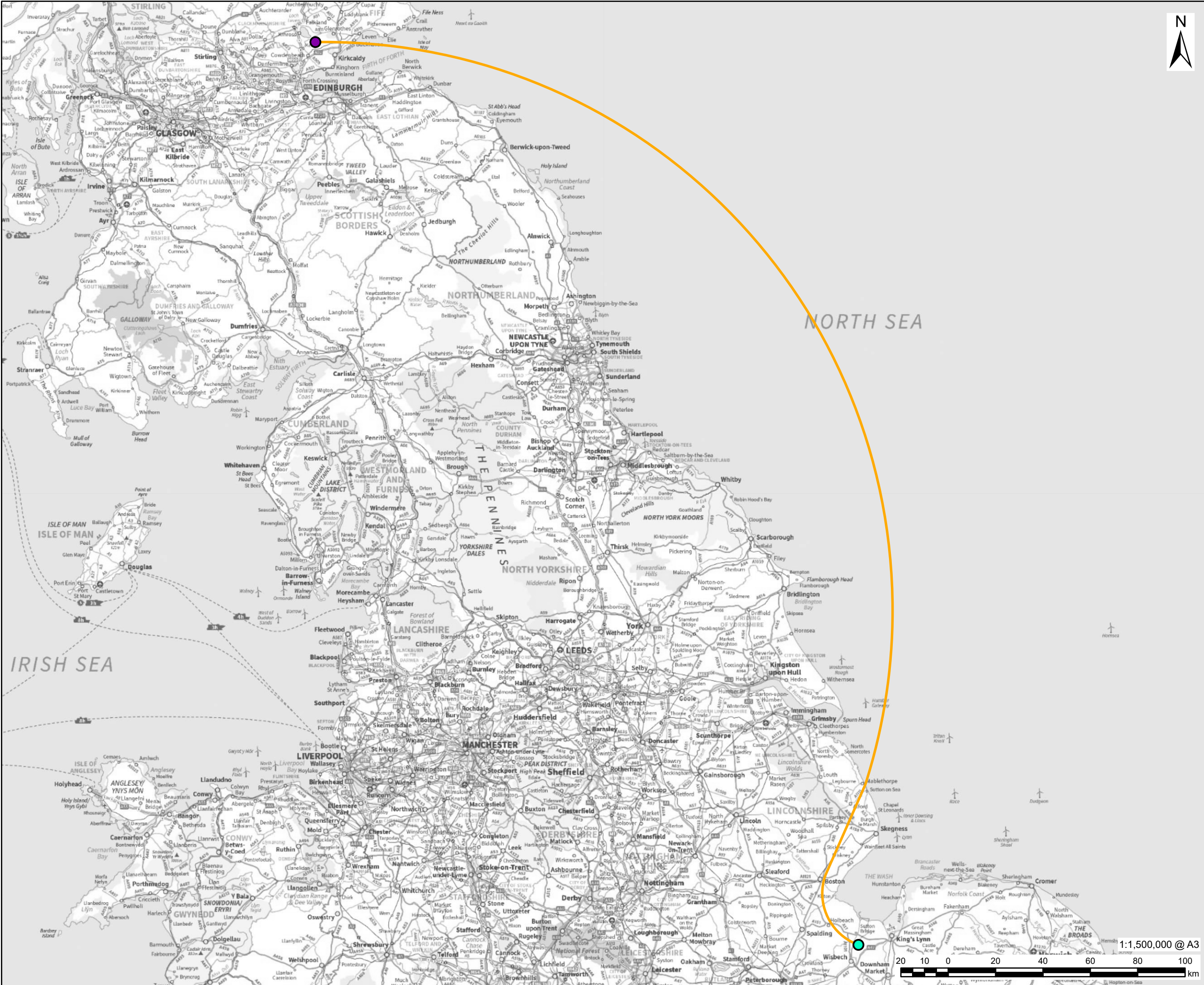
Scottish Power Energy Networks (SP Energy Networks, also referred to as ‘the Applicant’) is applying to Fife Council under the Town and Country Planning (Scotland) Act 1997 for planning permission for the Scottish onshore components of Eastern Green Link 4 (EGL4, also referred to as ‘the Project’).

The Project is a subsea High Voltage Direct Current (HVDC) electricity link between Westfield in Fife, Scotland and Walpole in Norfolk, England which will reinforce the National Electricity Transmission System (NETS). An overview of the Project is shown in **Figure 1. Eastern Green Link 4**. The onshore elements of the Project in Scotland are collectively referred to as ‘the Scottish Onshore Scheme’ and comprise underground cables and a converter station. The Applicant is seeking planning permission in full for the underground AC and DC cables and planning permission in principle for the converter station.

The Scottish Onshore Scheme will begin at the new 400 kV Westfield Substation in Fife (which does not form part of this application) with approximately 1 km of underground High Voltage Alternating Current (HVAC) cables connecting the substation to a new converter station. From the converter station approximately 16.2 km of underground HVDC cable will be installed to a landfall north of Kinghorn on the Fife coast where the underground cables are connected to the subsea cables. **Figure 2. Scottish Onshore Scheme Location Plan** shows the location of the Scottish Onshore Scheme. More information about the Scottish Onshore Scheme can be found in **Section 2 The Scottish Onshore Scheme**.

The Applicant has carried out an Environmental Impact Assessment (EIA) of the Scottish Onshore Scheme as part of the planning applications. This Non-Technical Summary (NTS) forms part of the Environmental Impact Assessment Report (EIAR) and has been produced to present the key findings from the EIA in a clear and concise format, using non-technical language. The purpose of the NTS is to provide readers with an understanding of the following:

- Eastern Green Link 4, in particular proposals for the Scottish Onshore Scheme including information about its key components, their location, design and construction;
- The environmental characteristics of the area in the which the Scottish Onshore is located and how it could be impacted;
- The mitigation measures which have been incorporated into the design, construction and operation of the Scottish Onshore Scheme; and
- The environmental effects of construction, operation and decommissioning of the Scottish Onshore Scheme and if they are likely to be significant or not.



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PROJECT

Eastern Green Link 4

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LEGEND

- Walpole Substation Location
- Westfield Substation Location
- Indicative Route

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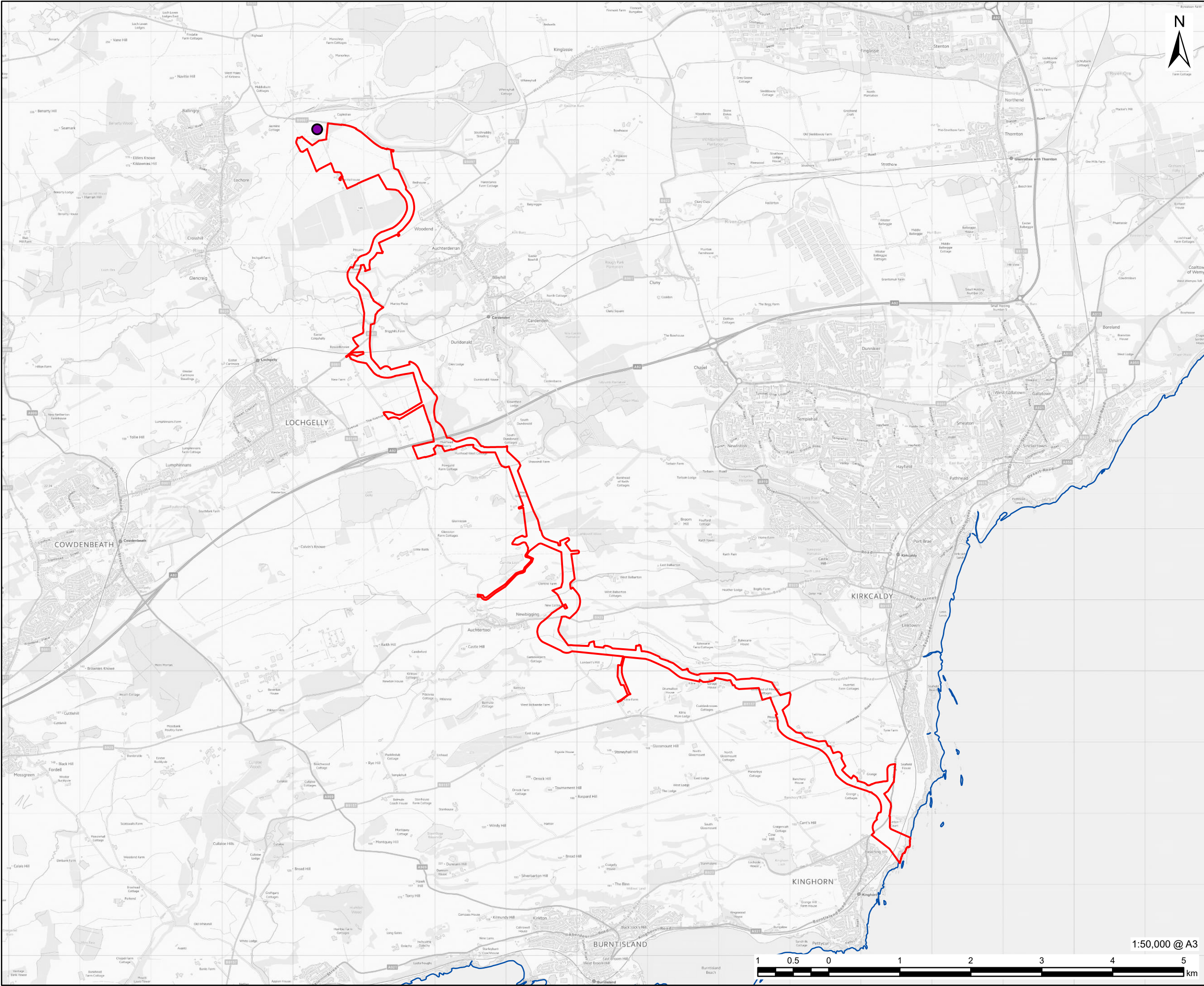
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FIGURE TITLE

Eastern Green Link 4

FIGURE NUMBER

Figure 1



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Eastern Green Link 4

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LEGEND

- Planning Application Boundary
- Westfield Substation Location
- Mean Low Water Springs (MLWS)



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FIGURE TITLE

Scottish Onshore Scheme Location Plan

FIGURE NUMBER

Figure 2

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1.2 About Eastern Green Link 4

Overview of the Project

EGL4 is a major reinforcement of the National Electricity Transmission System (NETS) which will provide additional north-south transmission capacity across transmission network boundaries between Scotland and England, ensuring that renewable energy is transported from where it is produced to where it is needed, reducing constraints on the network. The Project extends between Westfield in Fife, Scotland and Walpole in Norfolk, England, and comprises the components described below.

- **Scottish Onshore Scheme:** comprising a converter station at Westfield in Fife, Scotland which will be connected to the existing NETS via the new 400 kV Westfield Substation by approximately 1 km of underground AC cables. From the converter station approximately 16.20 km of underground DC cable will be installed to a landfall north of Kinghorn where the underground DC cables are joined to the subsea DC cables. More details regarding the Scottish Onshore Scheme are contained in **Section 2 The Scottish Onshore Scheme** of this NTS.
- **Marine Scheme:** comprising a subsea DC cable route from the landfall at Kinghorn on the Fife coast, where it connects to the Scottish Onshore Scheme through the North Sea to a landfall on the Lincolnshire Coast, where it connects to the English Onshore Scheme.
- **English Onshore Scheme:** comprising a converter station connected to the NETS via a new Walpole Substation in west Norfolk as well as underground DC cables from the converter station to a landfall on the Lincolnshire coast where it connects to the Marine Scheme.

Need for the Project

As part of their commitments to tackling climate change, the UK and Scottish Governments have set legally binding targets to reach net zero in greenhouse gas emissions by 2050 and 2045. In delivering net zero, the electricity system (how electricity is generated, transmitted, distributed and used) is undergoing transformational change.

To facilitate renewable forms of electricity generation such as offshore and onshore wind, new electricity transmission network infrastructure is needed to ensure that energy can be transported from where it is generated to where it is used. With electricity demand predominantly located in the south of Great Britain and considerable renewable energy resources in the north this leads to high north-south power flows on the electricity transmission system. This requires an increase in cross-border electricity transmission capability so that energy can be transported to areas of increased demand further south in Great Britain and to avoid constraints on the system.

The Applicant

SP Energy Networks, acting on behalf of SP Transmission, the Transmission Owner (TO) and Licence Holder responsible for the electricity transmission network in central and southern Scotland, have been working jointly with National Grid Electricity Transmission (NGET) to

develop proposals for EGL4, with SP Energy Networks being responsible for the Scottish Onshore Scheme.

2. The Scottish Onshore Scheme

2.1 Development of the Scottish Onshore Scheme

Overview

SP Energy Networks takes a systematic approach to the development of new electricity transmission infrastructure such as the Scottish Onshore Scheme. In line with SP Transmission's statutory duties, this requires a range of environmental, technical and economic factors to be considered and balanced. This includes the potential impacts on the environment and people, factors influencing technical feasibility as well as factors influencing cost.

In developing the Scottish Onshore Scheme, SP Energy Networks firstly considered a range of alternatives as part of a routeing and siting study. This comprised the identification and assessment of alternative landfall and converter station sites (siting) and the identification and assessment of alternative underground cable routes (routeing) and concluded with the identification of a Preferred Option. This was then subsequently further developed and refined through engineering design, Environmental Impact Assessment (EIA) and statutory pre-application consultation (PAC) including landowner engagement.

Converter Station Site Selection

Six potential converter station sites were identified, each within a study area extending 5 km in all directions from the point of connection at the new 400 kV Westfield Substation. Converter Station Site 3 was identified as the preferred site due to a number of advantages over the other sites considered, in particular its proximity to the existing substation which provides opportunities to co-locate infrastructure with similar characteristics with regard to appearance, as well as a reduction in the length of AC underground cable required.

Landfall Site Selection

Four potential landfall sites were identified within along the Fife coastline stretching from east of Aberdour/Silver Sands Bay to west of Lower Largo/Largo Bay. Two landfalls, landfalls A (north of Kinghorn) and D (east of Lower Largo), had relative advantages and disadvantages, so both were taken forward for further consideration as part of the identification of alternative route options. Landfall A required a longer subsea cable route through the Firth of Forth with a shorter underground cable route to the Westfield area while Landfall D required a shorter subsea cable route and longer underground cable route.

Underground DC Cable Route Selection

Three potential underground DC cable corridors (referred to in the routeing and siting study as Blue, Orange and Green Route Corridors) were identified based on the shortlisted landfall and converter station sites (Landfall A and D and Converter Station Site 3). These options were developed to be as direct as possible between the landfall and converter station while taking account of environmental and technical constraints and considerations, either avoiding or reducing impacts on the environment and people through careful route selection and/or choice of installation method. The main differences between the Route Corridors related to their length and the nature of the areas which they cross. The Blue Route Corridor

connected Landfall A to Converter Station Site 3 while the Orange and Green Route Corridors connected Landfall D to the Converter Station Site 3. The Green Route was discounted as, compared to the Orange Route Corridor, it was considered to have potential for greater impacts on the environment.

Identification of the Preferred Option

In order to identify an overall Preferred Option for the Scottish Onshore Scheme, the three key components (landfall site, underground cable route and converter station site) required to be brought together to establish an end-to-end onshore option. Based on the shortlisted components above there were two end-to-end options:

- Landfall D to Converter Station Site 3 utilising the Orange Route Corridor
- Landfall A to Converter Station Site 3 utilising the Blue Route Corridor

The Blue Route Corridor comprising Landfall A and the Converter Station Site 3 was identified as the Preferred Option. Due to its shorter, more direct route it was considered to best balance technical feasibility with impacts on the environment and people.

Further Design Development

Following identification of the Preferred Option, more detailed engineering studies were undertaken in parallel with the EIA. These helped to refine the broad corridor which formed the Preferred Option into a more detailed design for the purpose of the planning application.

2.2 The Scottish Onshore Scheme

The Converter Station (inc. Underground AC Cable Route)

Overview

Converter stations are the key components of a DC system and are required at both ‘ends’ of the Project. They enable electricity to be converted from AC to DC or vice versa depending on the direction of operation. The Project is bi-directional meaning that it can export or import electricity subject to the requirements of the NETS.

The proposed converter station site is located immediately east of the new 400 kV Westfield Substation (which in turn is located adjacent to the existing Westfield Substation), within agricultural fields. The converter station site will be accessed from the B9097 to the immediate north. The site comprises approximately 55 ha of agricultural land divided into five fields by hedgerows/fencing. It is bounded to the north by the B9097 and to the east, west and south by local roads.

The Proposed Converter Station

Converter stations contain specialist electrical equipment to undertake the conversion of electricity – some of this must be located indoors within buildings in order to protect the equipment. The size and number of buildings is informed by the size of the electrical equipment which they house and necessary safety clearances as well as climatic factors such as proximity to the coast and exposure to saline pollution. The largest buildings which house the converters are up to 28.5 m tall. However, other equipment including transformers will be located outdoors. Outdoor equipment will be up to a maximum height of 18 m.

The exact number and layout of buildings varies by specialist supplier. However, the total operational footprint of 8.75 hectares (ha) (based on 350m by 250m), referred to as the converter station platform is broadly the same. For this reason, SP Energy Networks is seeking planning permission in principle for the converter station, with the EIA based on maximum worst-case parameters with which the final detailed design will comply. This approach is based on the Rochdale Envelope approach which allows specific maximum parameters to be identified for which the likely significant effects are assessed on a realistic 'worst case' basis. This allows sufficient flexibility for detailed design to be undertaken within these parameters. For the purposes of planning permission in principle, the converter station platform comprises two zones:

- Zone 1 – to the east of the platform formed by an area of 3.75 ha. This zone will accommodate enclosed buildings up to a maximum height of 28.5m.
- Zone 2 – to the west of the platform formed by an area of 5 ha. This zone will accommodate outdoor electrical equipment up to a maximum height of 18m

The converter station site will be within a fenced compound with restricted access. An approximately 3 m high palisade fence will be erected around the platform with additional fencing around the perimeter of the earthworks. The site will also be monitored by CCTV and security gates will be in place for restricted/controlled access.

Lighting of the converter station once operational will be required for safety and security purposes. This will be minimised wherever possible and will be directional to prevent/reduce light spill. External lighting will be off as a default during the hours of darkness unless otherwise needed. The design of the lighting scheme for the converter station is subject to detailed design.

Access to the site during construction and operation will be via the B9097. There are two existing access points which are proposed to be upgraded and utilised. To the west of the site, the existing junction which provides access to North Pitkinny Farm will be upgraded and retained for the operational access. Up to 150 m of new permanent access road will be installed to provide access to the converter station platform.

As part of the converter station, landscape planting is proposed. This also seeks to enhance opportunities for greater biodiversity as well as mitigating any visual impacts and aligning to the surrounding environment as much as possible. Key aspects of the outline landscape plan include tree and scrub planting to strengthen existing hedgerow and woodland along the site boundary, notably along the B9097 road and the eastern and western boundaries. Habitat lost during the construction phase of the converter station will be replaced and overall habitat quality enhanced through the creation of native woodland, hedgerow, wet grassland, scrub planting, and species-rich meadow where appropriate, supporting the delivery of Biodiversity Net Gain. Landscape bunds are also proposed around the converter station to reinforce the site's landscape structure, enhance ecological connectivity and provide visual screening. The highest priority bunds are on the eastern and western boundaries, followed by the southern boundary.

The AC Underground Cable Route

The converter station will be connected to the NETS via an approximately 1 km long underground AC cable route between the converter station and the new 400kV Westfield substation. It will comprise of six cables, generally installed in ducts, typically up to 300 mm in diameter, laid three per trench; with each trench typically 1.4 m wide by minimum 1.4 m deep (i.e. up to two trenches). As with the DC cables (described below), to enable cable installation a working corridor up to 41.8 m wide will be required comprising temporary access, haul road, cable trench, drainage and topsoil and subsoil storage. This width is necessary due to the increased spacing required for AC cables.

The Underground DC Cable Route

Overview

The underground DC cable route extends between the converter station at Westfield and the landfall north of Kinghorn. It is routed in a broadly southern/southeastern direction crossing agricultural land for much of the route. A DC link comprises two cables (i.e. a single pair is one circuit). Underground cables are generally installed in ducts. These are laid side by side within a trench typically 1.0 m wide by 1.4 m deep, however, this will vary according to ground conditions.

To enable DC cable installation, a working corridor typically 43 m wide is required for the majority of the route. In some locations the working corridor is wider, up to 65 m wide. The temporary working corridor includes temporary access, a haul road, cable trench, drainage and topsoil and subsoil storage. Once cable installation is complete the working corridor would be reinstated to its former use.

Installation Methods

Cable installation is usually undertaken using open cut methods. In this method, cables will either be directly laid into an excavated trench which is then backfilled, or a duct (plastic or steel pipe) is laid into the trench after which cables will then be pulled through the pre-laid duct. SP Energy Networks will use the latter method for the Scottish Onshore Scheme as this will enable ducts to be installed, for cable trenches to backfilled and some parts of the working corridor reinstated earlier which will reduce potential environmental effects. Cables will be pulled through the pre-installed ducts and adjacent cable sections joined together at joint bays. At some locations where obstacles or constraints such as roads, railway lines, woodland or watercourses require to be crossed trenchless methods such as Horizontal Directional Drilling (HDD) will be used. Eleven locations have been identified where trenchless methods, assumed to be HDD, will be used to reduce impacts.

Cable installation does not require to be undertaken sequentially; as a result, installation could occur in multiple sections along the length of the proposed route in parallel and therefore installation is unlikely to be completed in a linear fashion. The method of installing ducts and backfilling, as described above, will limit the extent and duration of construction activity at any given location including the length of time that section of land remains disturbed for. The exact programme will dependent on a number of factors including the underlying ground conditions and installation methods used.

Generally, construction will take place in 1 km sections with main construction lasting between 3-6 months per section. Site preparation / clearance would be separate as this may

be impacted by other factors including ecological constraints. Overall cable installation will be undertaken over a 2-3 year period.

Cable Jointing

Joint bays are required between adjacent cable sections to join them together. The exact number of joint bays will depend on the cable route and constraints present as these will dictate the length of cable sections to be installed but sections will be up to 1 km in length. Joint bays will be formed by building a concrete plinth (or similar) in the base of the trenches. Joint bays must be clean and dry so temporary covers will be erected at jointing locations. Joint bays could remain open for several weeks to allow for trench and joint bay excavation, cable pulling, jointing and reinstatement. Due to the precise nature of jointing operations, it may require continuous 24-hour working for short periods whilst the jointing works are completed. Once the cable sections are joined and backfilled, temporary covers will be removed and land will be reinstated, aside the temporary haul road which will remain until the cable corridor is complete in its entirety and then land reinstated along its length. Reinstatement is further described within the section below.

Reinstatement of the Working Corridor

As set out within the **Section: Installation Methods** above, it is likely that reinstatement will be undertaken progressively with each section of the cable trench reinstated following the installation of ducts. Full reinstatement of the working corridor, for example complete removal of the temporary haul road, would not occur until after cables have been pulled through the ducts, jointed and tested.

Land will be reinstated to its former use and agricultural areas returned to landowners for cultivation during the first available planting season following completion of construction. Any hedgerows removed to facilitate construction activities will be replanted with an objective to enhance the boundary features where possible. The replanting would consist of a variety of native species, typical of those found within the local area. Where possible and subject to agreement, existing hedgerows may be removed, stored and replanted. Other vegetation along the proposed route and in areas temporarily disturbed by construction would also be reinstated. Pasture, road verges and other areas temporarily affected will be seeded with an appropriate species rich wildflower or grass seed mix.

The Landfall

Overview

The Landfall is the interface between the Scottish Onshore Scheme and Marine Scheme of the Project. It is where the subsea cables come ashore and are joined to the onshore underground cables at a buried Transition Joint Bay (TJB). The TJB consists of an underground concrete plinth, constructed of reinforced concrete, and a box-like structure that houses the cable joints between the subsea and onshore underground cables.

Landfall Installation Methods

Due to the constraints and topography along the coastline, it is proposed that trenchless methods (i.e. HDD) will be utilised to construct the landfall. A temporary working area will be required to the west of the railway line with the HDD extending beneath the railway line, coastal path and cliffs such that they will not be impacted by the works.

HDD will be used to drill small holes (at least one per cable) from the TJB to a breakout point in the Firth of Forth. Two ducts (plastic or steel pipes) would be inserted in the drilled holes and the subsea cables pulled ashore through the ducts and joined to the underground DC cables at the TJB. Depending on ground conditions, the HDD may require several attempts to successfully drill through the required length, and as such the working corridor widens at the landfall to accommodate the potential for additional drill attempts. The depth of the landfall will range from 1.4 m below existing ground level at the TJB to up to 31 m below the railway line. The maximum depth will be 42.49 m below ground level.

Access to the landfall working area will be via a temporary bellmouth/haul road connecting to the A921.

Reinstatement of the Landfall

As with the underground cable route corridor, full reinstatement would not occur until the cables have been tested. It is likely that some equipment such as the HDD would be demobilised, however, temporary access and some laydown or storage would remain until full reinstatement.

Construction of the Scottish Onshore Scheme

Subject to securing the necessary consents, it is expected that construction of the Scottish Onshore Scheme will start in 2027 and last for approximately 6 years. This will consist of:

- Construction of the landfall: the exact timing will be influenced by installation of the Marine Scheme but it is expected that construction will occur over two periods (1. Installation of ducts, and 2. Pulling and jointing of cables);
- Construction of the DC cable route: construction will be undertaken over a 2-3 year period. Installation works are unlikely to be sequential along the route, with work undertaken at various sections of the alignment simultaneously. As noted above because installation works will be undertaken using a ducted method parts of the working corridor may be reinstated more quickly with the full corridor not reinstated until the cables have been installed and the HVDC link commissioned;
- Construction of the converter station: construction is expected to take approximately 6 years to complete from initial groundworks to completion of construction;
- Installation of the AC cables: installation of the AC cables between the converter station and the new 400 kV Westfield Substation will be undertaken simultaneously as the construction of the converter station but will likely only take place during the final year of construction; and
- Commissioning activities of the HVDC link from end to end which will include various tests to ensure individual components and the full link is operating appropriately before integrating the link into the existing electricity transmission network.

Operation of the Scottish Onshore Scheme

Once operational, the Project will form an integral part of the electricity transmission network. The anticipated operational life of the converter station is approximately 40 years. It is likely that after this period refurbishment and plant replacement will extend the life of the converter station rather than decommissioning. Operational activity along the proposed DC

cable route (including the landfall) would mainly be limited to non-intrusive inspections. There is also the potential for localised intrusive works for cable repairs, in the event of a fault. Cable repair works would be similar to those undertaken at installation, but on a much smaller scale as only the damaged section of cable would be replaced.

Decommissioning of the Scottish Onshore Scheme

In the event that the Scottish Onshore Scheme ceases to be required then it could be decommissioned. A Decommissioning Plan will be prepared and planning permission obtained, if required, in accordance with the relevant legislation in place at the time.

Dependent on specific requirements the redundant cables could either be left in-situ (which would have the least environmental effect), or all or parts of the cable could be removed for recycling. Where recycling is not possible removed cables will be disposed of in accordance with the relevant waste disposal regulations at the time of decommissioning.

The main components of the converter station will be dismantled and removed for recycling, wherever possible. Where this is not possible disposal will be undertaken in accordance with the relevant waste disposal regulations at the time of decommissioning.

The process of decommissioning will be similar to construction meaning the likely significant environmental effects will be comparable. As a result, decommissioning has not been assessed in the EIAR



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LEGEND

Planning Application Boundary

Converter Station Platform - Zone 1

Converter Station Platform - Zone 2

AC Cable Route Corridor

DC Cable Route Corridor

Temporary Drainage - Attenuation Basin

Converter Station - Permanent Attenuation Basin

Converter Station - Permanent Attenuation Basin Road

Converter Station - Temporary Car Parking

Converter Station - Temporary Construction Compound

Converter Station - Permanent Earthworks

Converter Station - Temporary Earthworks

Converter Station - Landscape Mitigation (Permanent Landform Re-profiling)

Converter Station - Permanent Access Road

Converter Station - Temporary Access Road

Existing Vegetation to be Retained

Existing Woodland to be Enhanced

Proposed Converter Station Perimeter Strip Grassland Mix

Proposed Shrub Planting Mix

Proposed Species Diverse Meadow

Proposed Swale with Wet Grassland Seed Mix

Proposed Wet Grassland Seed Mix

Proposed Woodland

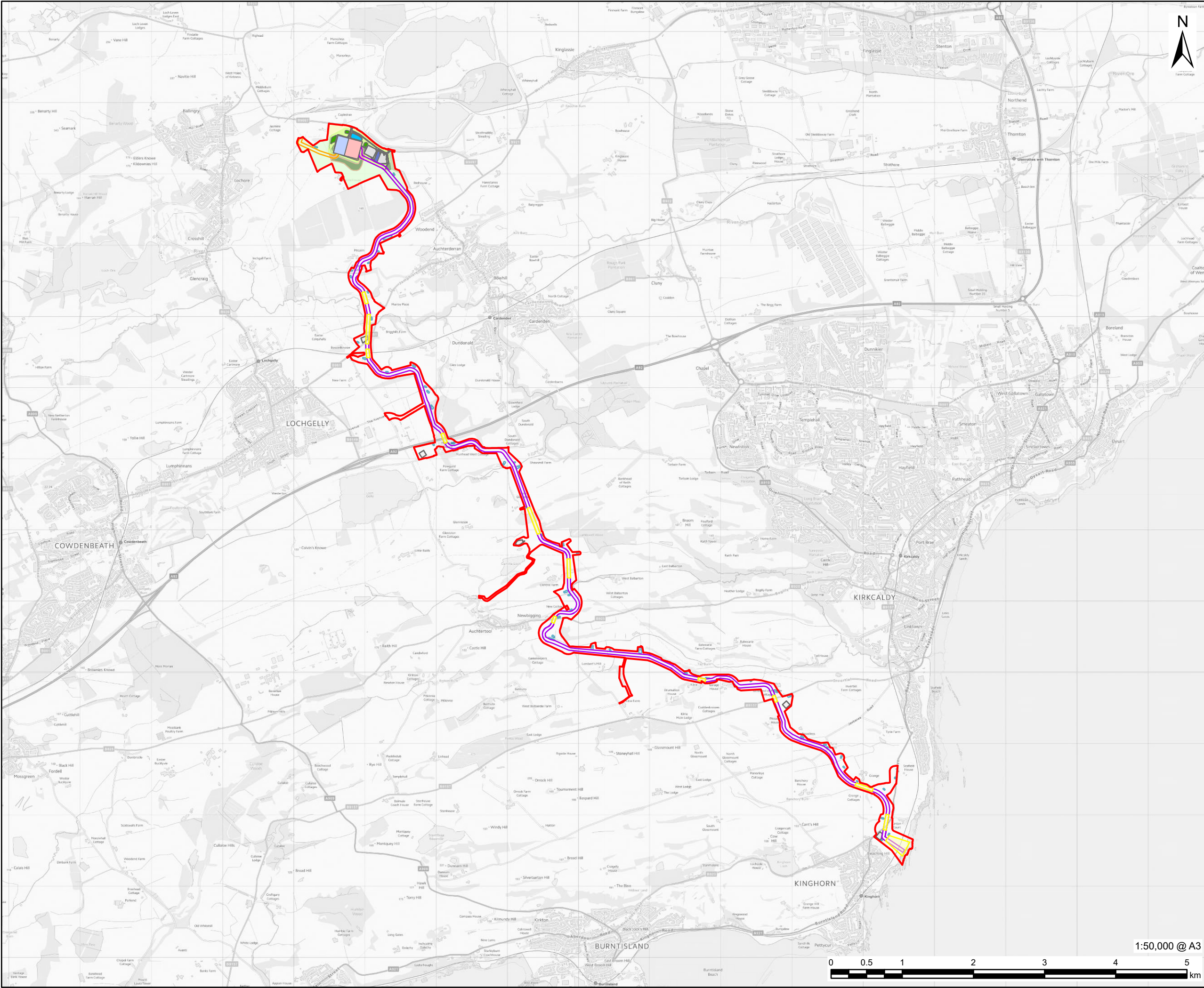
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FIGURE TITLE
Converter Station Site Plan

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Figure 3



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LEGEND

- Planning Application Boundary
- Converter Station Platform - Zone 1
- Converter Station Platform - Zone 2
- Cable Route Trenchless Crossing – HDD
- AC Cable Route Corridor
- DC Cable Route Corridor
- Temporary Drainage - Attenuation Basin
- Temporary Construction Compound - Underground Route
- Converter Station - Permanent Attenuation Basin
- Converter Station - Permanent Attenuation Basin Road
- Converter Station - Temporary Car Parking
- Converter Station - Temporary Construction Compound
- Converter Station - Permanent Earthworks
- Converter Station - Temporary Earthworks
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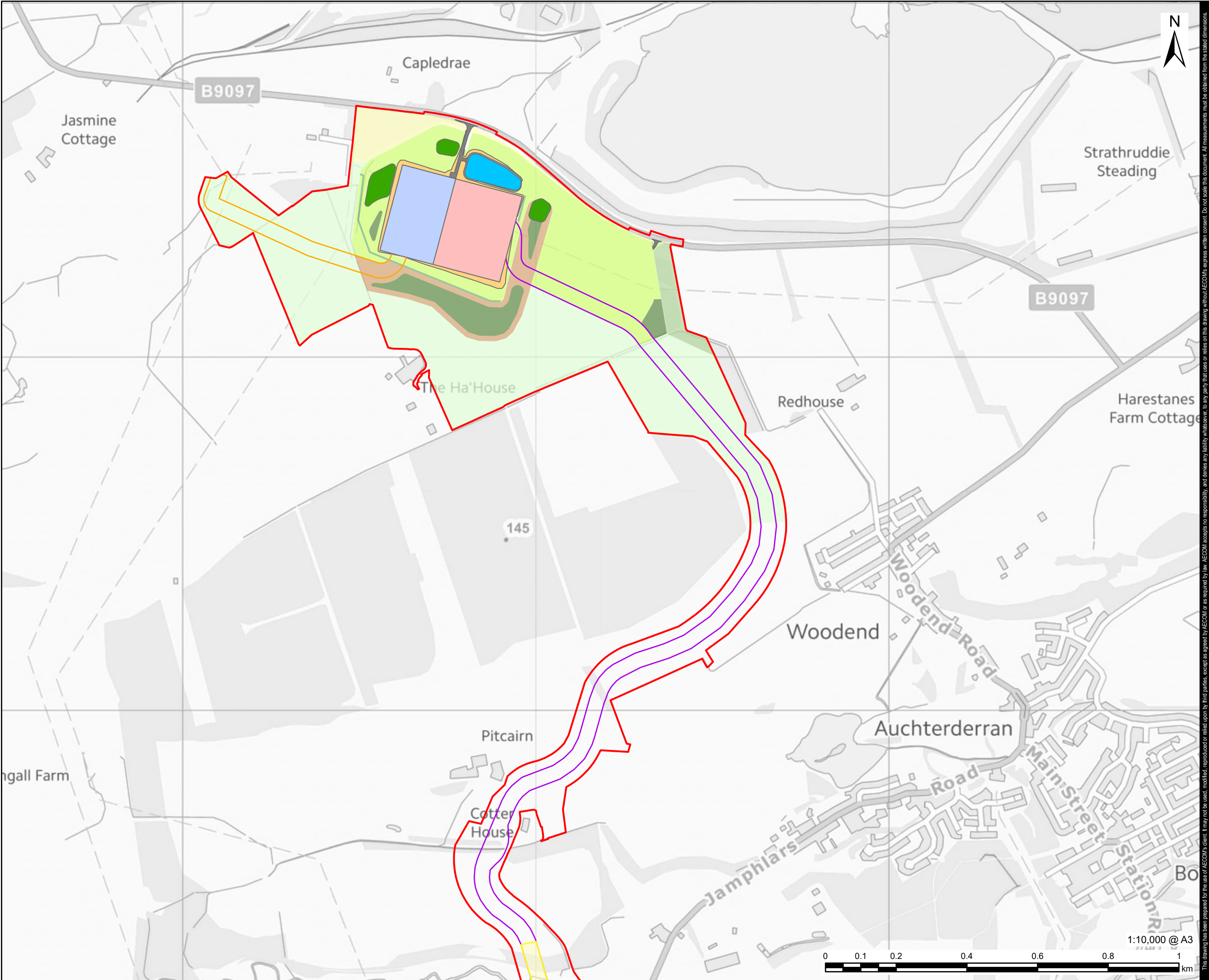
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FIGURE TITLE

Underground DC Cable Route Plan

FIGURE NUMBER

Figure 4 (Sheet 1 of 7)



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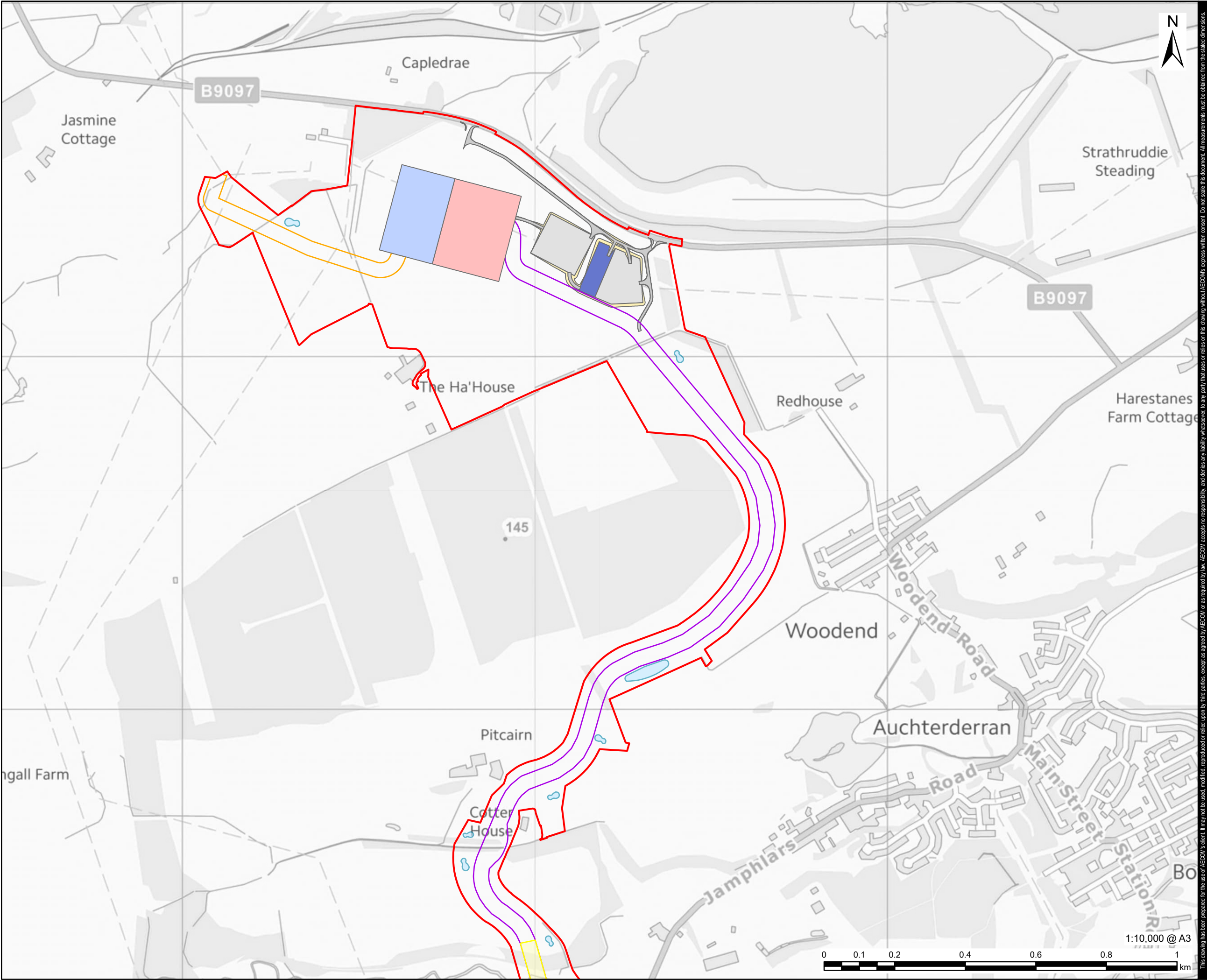
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FIGURE TITLE

Underground DC Cable Route Plan

FIGURE NUMBER

Figure 4 (Sheet 2 of 7)



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- Converter Station - Temporary Access Road

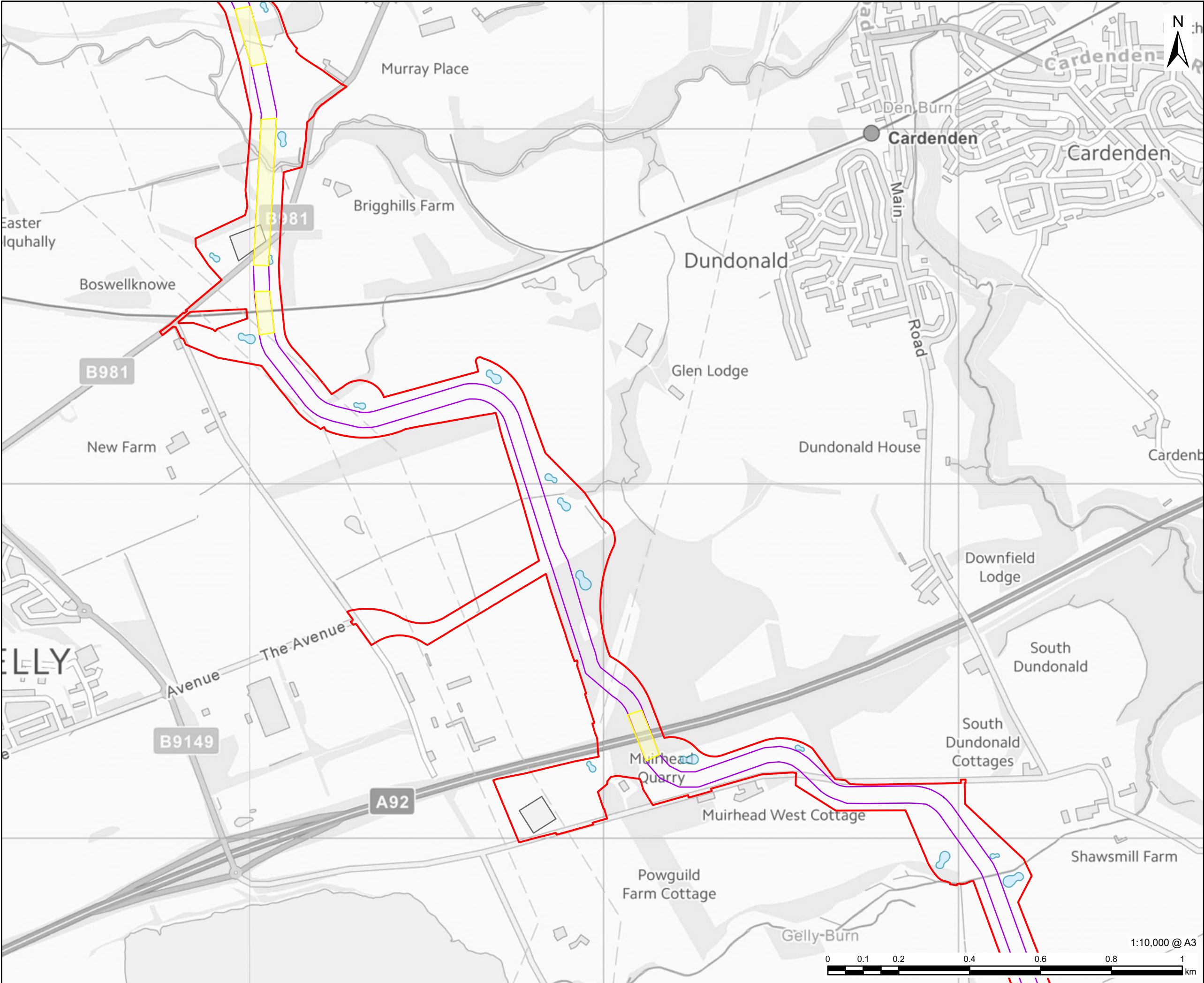
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FIGURE TITLE
Underground DC Cable Route Plan

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- ▬ Temporary Drainage - Attenuation Basin
- ▬ Temporary Construction Compound - Underground Route

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ISSUE PURPOSE

Non Technical Summary

PROJECT NUMBER

60707131

FIGURE TITLE

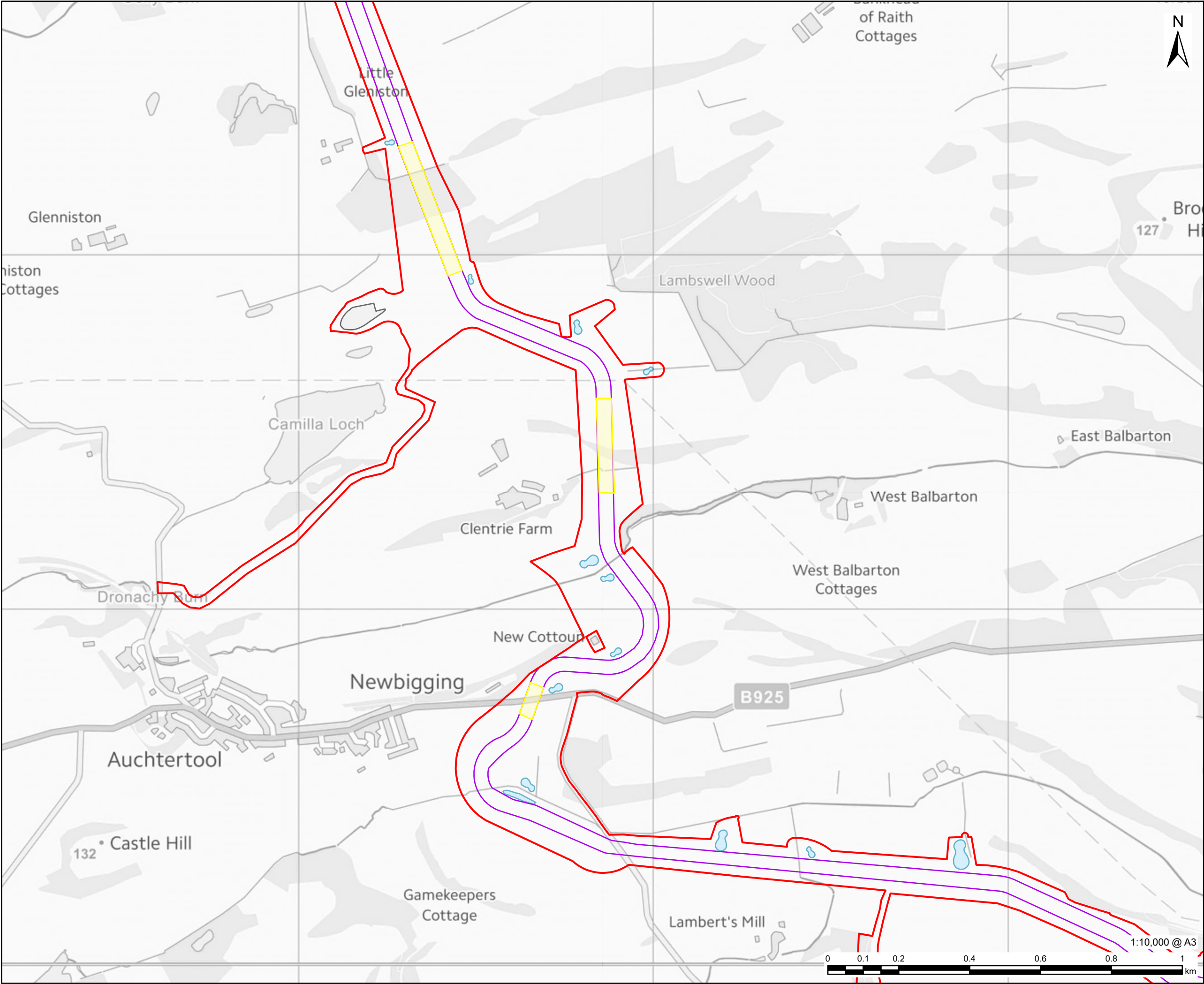
Underground DC Cable Route Plan

FIGURE NUMBER

Figure 4 (Sheet 4 of 7)



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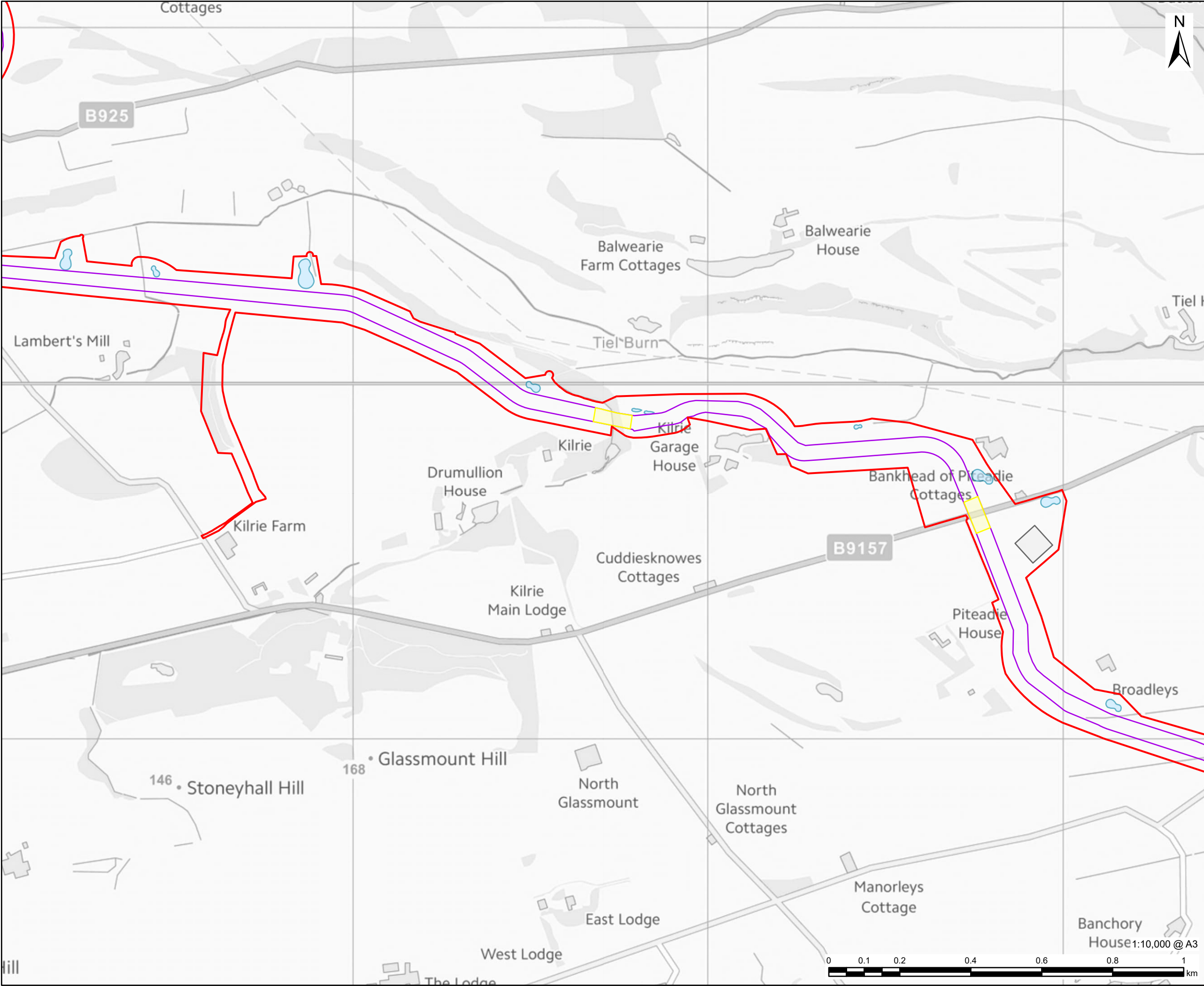
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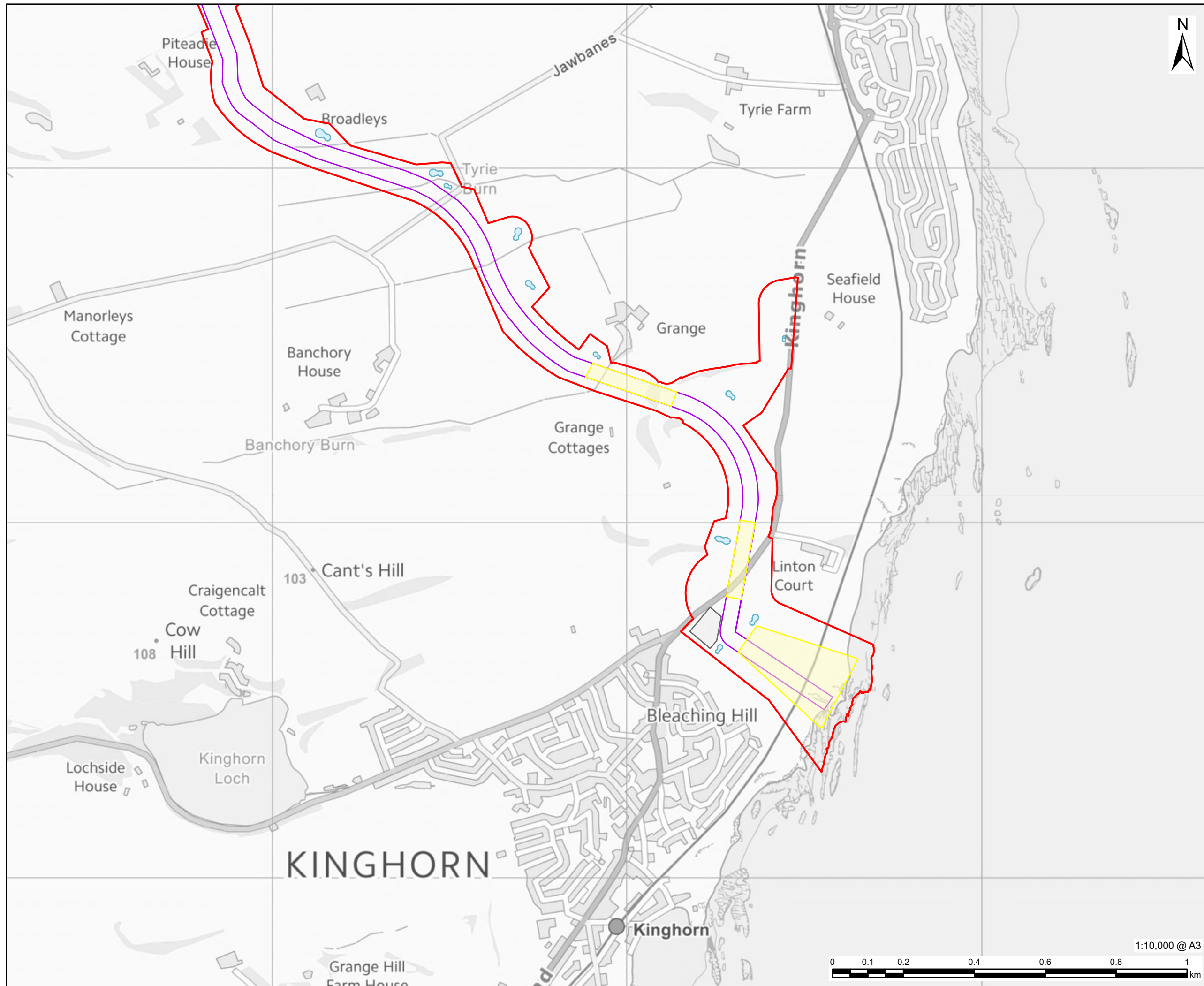
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FIGURE TITLE
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Non Technical Summary

PROJECT NUMBER

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FIGURE TITLE

Underground DC Cable Route Plan

FIGURE NUMBER

Figure 4 (Sheet 7 of 7)

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3. About Environmental Impact Assessment

3.1 Overview of Environmental Impact Assessment

EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development such as those potentially occurring as a result of the construction, operation and decommissioning of the Scottish Onshore Scheme. Through the early identification and evaluation of the likely significant environmental effects of a proposed development, EIA enables appropriate mitigation (that is measures to prevent, avoid, reduce or offset significant adverse effects) to be identified and incorporated into the proposed development's design, or commitments to be made to environmentally sensitive construction methods and practices.

The EIA of the Scottish Onshore Scheme has been undertaken in parallel with the development of its design thereby maximising opportunities to mitigate likely significant effects as they have been identified. This approach ensures mitigation is embedded in the design of the Scottish Onshore Scheme and forms an integral component of it.

The results of the EIA also ensure that decision makers, in this instance Fife Council, as well as statutory consultees and other interested parties including local communities, are aware of the Scottish Onshore Scheme's likely environmental effects and whether these may be significant or not so that they may be considered in the determination of the application for planning permission.

A significant adverse effect is not necessarily one that would make the Scottish Onshore Scheme unacceptable, nor is a significant beneficial effect necessarily one that would make it acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties, in particular decision makers, are aware of the environmental effects (in particular those effects which are likely to be significant) of the Scottish Onshore Scheme and consider these alongside other material considerations in determining the planning application.

3.2 Requirement for Environmental Impact Assessment

The relevant EIA legislation with regard to applications for planning permission under the Town and Country Planning (Scotland) Act 1997 are the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations). The EIA Regulations include two schedules of development; Schedule 1 lists development for which EIA is mandatory and must be undertaken while Schedule 2 lists development for which EIA may be required if it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

None of the elements which make up the Scottish Onshore Scheme or the wider Project (i.e. converter stations, underground cables and subsea cables) are identified in Schedule 1 or 2 of the relevant EIA Regulations. As the Scottish Onshore Scheme is not classed as 'Schedule

1 Development' EIA is not mandatory. With regard to Schedule 2, while none of the elements which make up the Scottish Onshore Scheme fall under the descriptions of development in Category 3 Energy Industry, converter stations could broadly be interpreted as an industrial estate development under Category 10 Infrastructure Projects with them having some similar characteristics. EIA may be required for 'Schedule 2 Development' subject to certain thresholds being met or exceeded and having regard to the criteria in Schedule 3 of the EIA Regulations. In such instances the requirement for EIA can be determined through submission of a screening opinion request to the relevant authorities (in this case Fife Council). Planning Circular 1: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 makes clear that the basic test of the need for EIA in is the likelihood of significant effects on the environment.

In this instance, having regard to SP Transmission's statutory duties as a transmission licence holder under the Electricity Act 1989 and the guidance contained in Circular 1/2017, SP Energy Networks considered it appropriate to undertake an EIA and have therefore undertaken the EIA on a voluntary basis.

3.3 Approach to Environmental Impact Assessment

Baseline Studies

In order to identify and assess the potential impacts and likely significant resulting from the Scottish Onshore Scheme it was necessary to first establish the environmental conditions that currently exist within and in the vicinity of its application boundary and identify receptors which could be affected.

For each environmental aspect considered in the EIA, baseline conditions were established through some or all of the following processes:

- Undertaking field surveys and recording observations or collecting data to establish the exiting baseline conditions;
- Reviewing secondary data sources (i.e. published documentation such as maps or records); and
- Consulting with stakeholders and requesting including with statutory and non-statutory bodies as well as landowners.

Identification and Assessment of Effects

The EIA Regulations require the likely significant effects of the Scottish Onshore Scheme to be identified. The EIA identifies adverse and beneficial effects and assesses their significance based on a combination of the sensitivity or value of the feature being affected (also known as the receptor) and the magnitude of the impact which would occur or (also known as the scale of change). The assessment takes into account a range of different factors including:

- Legislation, policy standards, guidelines or the environmental value of the receptor.
- The capacity of the receptor to absorb change and its recoverability.
- The likelihood of an effect occurring as well as its scale or duration.

The general approach to assessing the significance of an effect is identified below. It takes into account a combination of the sensitivity or value of the receptor being affected and the

magnitude of the impact. Effects assessed as ‘major’ or ‘moderate’ are considered to be significant while those assessed as ‘minor’ or ‘negligible’ are considered to be ‘not significant’. Effects may be beneficial (i.e. an improvement on the baseline condition) or adverse (i.e. a deterioration in the baseline condition).

Magnitude	Sensitivity or Value of Receptors				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

4. Results of the Environmental Impact Assessment

4.1 Introduction

The following sub-sections provide a summary of the results of each of the specialist assessments undertaken as part of the EIA of the Scottish Onshore Scheme. It is intended to highlight key sensitivities or receptors identified in undertaking baseline studies, identify likely significant or other notable effects and set out the mitigation measures which are proposed. For each environmental aspect considered in the EIA this section identifies the residual effects remaining taking account of mitigation and whether they are likely to be significant or not.

4.2 Landscape and Visual Amenity

The assessment has considered the likely significant effects on landscape and visual amenity resulting from the construction and operation of the Scottish Onshore Scheme. Landscape effects relate to the changes to the fabric, character, and quality of the landscape and how it is experienced. Visual effects concern changes in people's views and visual amenity as a result of the introduction of development. It should be noted that the assessment considered only temporary effects as a result of the underground cables and landfall as once operational these would be reinstated with no permanent effects.

A study area of 5 km from the converter station and 1 km from the landfall and underground cable routes was used for the assessment. A combination of desk-based research and fieldwork was used to establish the baseline conditions and inform the assessment of likely significant effects.

Landscape Assessment

The landscape assessment considers the likely significant effects on landscape designations and landscape character. There are two Local Landscape Areas (LLAs) within the study area. The proposed underground cable route crosses the Cullaloe Hills and Coast LLA while the proposed converter station lies approximately 2 km to the east/southeast of the Loch Ore and Benarty LLA.

Underground cable installation within the Cullaloe Hills and Coast LLA will result in minor adverse effects which are not significant. Removal of vegetation such as woodland or hedgerows is limited through a combination of using existing field accesses to access the cable route working corridor and the use of trenchless methods to cross woodland. As a result it would not have a significant effect on characteristic vegetation patterns within the LLA.

There would be no direct effect on the Loch Ore and Benarty LLA. Effects would be limited to indirect effects resulting in a very slight alteration to one of the key characteristics of the LLA from the elevated areas where outward views are possible, however, these are minor adverse and not significant.

Effects on landscape character have been assessed based on the Landscape Character Types (LCTs) present within the study area. No significant effects have been identified. The proposed converter station is located within the Lowland Hills and Valleys LCT. Effects on the LCT are assessed as minor adverse and not significant reducing to negligible and not significant as landscape planting establishes.

Visual Assessment

The visual assessment considers likely significant effects on visual amenity. It has been informed by assessment from fourteen different viewpoints which are considered to be representative of the range of views experienced by potential visual receptors within the study area. This includes views experienced from settlements including individual properties, recreational routes and roads. Receptors at the majority of viewpoints would experience effects which are predicted to be minor adverse or less and therefore are not significant. However, temporary significant effects have been identified from three viewpoints:

- Viewpoint 2 (representative of road users) located to the east of the converter station site on the B9097 east of Lochore,
- Viewpoint 3 (representative of recreational users) located to the west of the converter station on the core path network (path code R850) and
- Viewpoint 5 (representative of recreational users) located to the northwest of the converter station at Dunmore Fort.

The significant effects from these viewpoints are limited to the construction period only, with the exception of Viewpoint 2 which will be significantly affected during operation year 1. Effects on receptors would reduce in operation due to the establishment of proposed landscape planting which will help to integrate the converter station into its surroundings.

4.3 Ecology and Nature Conservation

The assessment has considered the likely significant effects of the Scottish Onshore Scheme on ecological features comprising nature conservation designations as well as important habitats and species.

The study area or 'Zone of Influence' varies for different ecological features depending on their sensitivity to environmental change. A combination of desk and field studies were carried out to identify and assess likely significant effects on ecological features. Field surveys included a range of habitat and protected species surveys including bats, otter, water vole, beaver, badger and great crested newts as well as wintering bird species.

There are a number of sites designated for nature conservation purposes within the study area. This includes Firth of Forth Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI) which is crossed by the landfall as well as sites in the wider area including the Outer Firth of Forth and St Andrews Bay Complex SPA, the Loch Leven SPA and SSSI and Camilla Loch SSSI. In addition three Local Wildlife Sites (LWS) are present in the study area Auchtertool Linn, Balwearie Braes, and Burntisland Binn LWS. None of the designated sites or the features for which they are designated will experience likely significant effects. At the landfall, the temporary nature of the works as well as the use of visual/noise barriers will prevent likely significant effects on the interests of the Firth of Forth designated sites. Other designated sites are typically more distant to the Scottish Onshore

Scheme or standard measures embedded in design and construction will prevent likely significant effects.

Direct loss of important habitats has been avoided as much as possible through the design of the Scottish Onshore Scheme including the use of trenchless methods in some areas. Potentially impacted habitats include small areas of lowland mixed deciduous woodland on the margins of the application boundary, hedgerows crossed by the underground cable route and within the converter station site as well as small areas of wet woodland. No significant effects have been identified on important habitats.

A combination of field surveys and existing records indicate protected species including bat, otter and badger are present within the study area. No significant effects have been identified on protected species, however, the assessment identifies that subject to further pre-construction surveys and detailed design/micro-siting protected species licences may be required for the removal of two trees with bat roosting potential, works to cross a watercourse on which an otter holt was identified and where works associated with a trenchless crossing may affect badgers.

Overall the ecology assessment identifies no significant effects on ecological or nature conservation interests.

4.4 Water Environment and Flood Risk

The assessment has considered the likely significant effects on the water environment including surface and ground water quality, hydrology and hydromorphology of surface water features, groundwater flow and levels as well as flood risk.

The study area for the assessment included water features within 1 km of the Scottish Onshore Scheme. As water quality impacts can sometimes extend downstream along watercourses, potential impacts beyond 1 km were also considered. Consideration has also been given to any groundwater features or groundwater dependent ecological sites outside the 1 km study area up to 2 km from the application boundary if it is considered that they might be hydrogeologically linked.

A combination of desk-based research and fieldwork was used to establish the baseline conditions and inform the assessment of likely significant effects. This included review of a range of data sources and records held by SEPA and Fife Council.

The converter station is located away from surface water features and has been micro-sited to avoid areas of increased flood risk as much as possible. While there is potential for impacts on the water environment during construction, for example through accidental pollution, such effects can be mitigated through the adoption of good practice measures. The converter station has the potential to increase surface water runoff through the establish of impermeable/semi-impermeable surfaces, however, a drainage strategy has been developed which incorporated Sustainable Urban Drainage Systems (SUDS) to reduce potential impacts. As result the construction and operation of the converter station is not likely to result in significant effects on the environment.

The underground DC cable route crosses or is in proximity to a number of water environment receptors including watercourse crossings by the cable and/or temporary haul road, proximity to private water supplies and the potential to encounter shallow groundwater.

Watercourse crossings comprise a mix of trenchless crossings of larger watercourses and open cut crossings of smaller watercourses and ditches. With standard mitigation and good working practices in place no significant effects would occur on watercourses crossed by the underground DC cable route. Where watercourses require to be crossed by the temporary haul road temporary watercourse crossings would be designed in accordance with SEPA guidance to prevent significant effects.

Two private water supplies (PWS) have been identified within the vicinity of the Scottish Onshore Scheme; PWS-01 approximately 160m away from the underground DC cable route and PWS-02 located within the underground DC cable route corridor. PWS-01 is not likely to be significantly affected as the source of the supply is understood to be deeper than the depth of the cable trench so it would not be affected by dewatering. PWS-02 is understood to be located directly within the working corridor and could be affected. Subject to further investigation a temporary or permanent replacement water supply would be provided; either a new private water supply or a connection to the mains.

Overall, the assessment concluded that there would no likely significant effects on the water environment. The adoption of standard mitigation and good working practices avoid or reduce adverse effects.

4.5 Cultural Heritage

The assessment considered the likely significant effects of the Scottish Onshore Scheme on archaeological and heritage resources which collectively includes designated assets such as scheduled monuments or listed buildings as well as non-designated assets. The assessment also considered the potential for previously unrecorded archaeology to be present and be impacted by the Scottish Onshore Scheme.

The assessment of existing baseline conditions identified 288 designated and non-designated historic environment assets within the 1 km study area, dating from the prehistoric period onwards.

The Scottish Onshore Scheme is located within areas showing evidence for previous industrial and agricultural activity. In particular, the converter station is located within a former open cast mine. As a result the site will have previously experienced high levels of ground disturbance. The areas around the former mine and along the underground DC cable route largely comprise ground that has been farmland for, at least, the last 200 years. It has not been subject to extensive settlement activity which could have impacted previously unrecorded archaeological remains apart from the mining activities at Glenniston, Brighills and Pitcairn. As such, there is the potential for previously unrecorded archaeological remains to be present.

A number of mitigation measures are proposed to avoid or reduce impacts on undesignated assets in the vicinity of the underground DC cable works as well as previously unrecorded archaeology. This includes, but is not limited to, archaeological investigation and monitoring as well as measures to protect in-situ remains or features such as dry-stone walls, and is expected to be informed by a phase of evaluation trenching. All mitigation will be agreed by the archaeological officer for Fife, and approved via a Written Scheme of Investigation (WSI).

Potential impacts resulting from the operational phase consisted of impacts to the setting of assets. The assessment concluded that no significant effects would result from change to the settings of assets due to the buried nature of the underground DC cable route while the converter station site will be screened from surrounding designated assets by vegetation and existing structures.

With mitigation measures in place no residual significant effects are predicted on cultural heritage and archaeology.

4.6 Access, Traffic and Transport

The assessment considers the potential impacts of construction traffic generated by the Scottish Onshore Scheme on factors including driver delay, road safety and community impacts on the public road network. Once operational, the Proposed Development would not generate significant traffic as it will be operated by a small onsite team of up to six people and can also be operated remotely. While there would be some traffic associated with operation, it would not result in likely significant effects and therefore operational traffic was scoped out of the assessment.

A combination of desk-based research and traffic counts on roads in the vicinity of the Scottish Onshore Scheme was used to establish the baseline conditions and inform the assessment of likely significant effects.

The assessment has been informed by forecast construction traffic figures generated by the Applicant based on the design of the Scottish Onshore Scheme and experience of similar projects. It is forecast that at its peak, construction of the converter station will generate 160 daily Heavy Goods Vehicle (HGV) movements (80 arrivals and 80 departures) and 600 daily Light Goods Vehicles (LGV) movements (300 arrivals and 300 departures). It is forecast that the underground DC cable route will generate 60 daily HGV movements (30 arrivals and 30 departures) and 60 LGV movements (30 arrivals and 30 departures) during the peak of construction activity. Based on these forecasts, 2029 is expected to be when peak construction occurs on with works taking place at both the converter site and along the underground cable route.

The forecast construction traffic was assessed against the baseline traffic flows to identify which roads should be subject to assessment:

- highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%)
- other specifically sensitive areas where traffic flows have increased by 10% or more.

This identified 10 road links which were subject to assessment based on forecast traffic increases. With the implementation of Construction Traffic Management Plans (CTMPs), effects on traffic and transport factors range from negligible to minor adverse and therefore are not significant.

4.7 Noise

The noise assessment considered the potential effects of noise generated by construction and operation of the Scottish Onshore Scheme. This was informed by site surveys to

measure existing background noise at sensitive locations in locations at the proposed converter station and landfall.

Construction of the converter station is not likely to result in significant noise effects. There are a small number of Noise Sensitive Receptors (NSRs) in the vicinity of the site, however, the implementation of Best Practicable Means (BPM) to reduce construction noise emissions would sufficiently control effects such that the Threshold Values in British Standard (BS) 5228-1 are unlikely to be exceeded for the vast majority of the works over day, evening and weekend periods. If exceedances do occur, these are likely to be infrequent and of short duration such that effects would not be significant.

A noise model was developed to inform the operational noise assessment for the converter station. The model has been used to predict the proposed developments sound emissions from the converter station at NSRs to the north (Capledrae) and south/southeast of the site (Ha'House/Pitkinny). Taking account of the equipment contained in the converter station, the distance to NSRs and the results of background noise monitoring, the change in noise levels can be modelled. This identifies effects would be minor adverse or no effect and therefore not significant during daytime and nighttime periods.

Noise associated with the installation of the underground DC cable route was assessed qualitatively taking account of BS 5228. The potential for significant noise effects increases with increased proximity to the underground DC cable route. Typical cable installation works are not significant at distances of 40 m or more from the working area. NSRs within 40 m of the typical cable installation works could experience moderate adverse effects during evenings and weekends which would be significant. In addition, NSRs in the vicinity of longer HDD spans along the cable route could experience moderate adverse effects during the nighttime, which is significant.

Noise associated with the landfall works was assessed quantitatively. Background noise measurements were taken at a representative location to the south of the landfall at Long Craigs Terrace. Acoustic barriers are proposed to attenuate noise, however, based on the HDD works short term moderate adverse effects during the nighttime which are significant would occur at the landfall.

4.8 Geology and Ground Conditions

The assessment considers the likely significant effects of the Scottish Onshore Scheme on geology and ground conditions. This includes underlying soils, superficial and bedrock geology, existing sources of land contamination including those associated with historic mining or quarrying activity, and sites designated for geological conservation purposes.

Baseline conditions at, and in the vicinity of, the Scottish Onshore Scheme have been established through a combination of desk study and preliminary ground investigation at targeted locations within the proposed converter station and along the proposed underground DC cable route. Underlying geology comprises glacial till and made ground overlying Carboniferous strata. Made ground or infilled ground is present throughout typically associated with the reinstatement of former coal mining or quarrying sites. In some localised areas to the north of the Scottish Onshore Scheme peat is recorded to be present within superficial deposits. While the majority of the land crossing crossed by the Scottish Onshore Scheme is used for agriculture, historically a large part of the area has been subject to

previous mining and quarrying activity with the potential to encounter contaminated soil and groundwater. In addition, geological conservation sites comprising the Firth of Forth Site of Special Scientific Interest (SSSI) and three Geological Conservation Review sites ((GCRs) are present on the coastline where the proposed landfall is located.

An assessment of likely significant effects was undertaken. The majority of potential impacts are associated with the construction of the Scottish Onshore Scheme as this is when most impactful or disturbing works such as excavations and trenching will occur. Potential impacts could affect underlying geology and soils, groundwater as well as human health. The assessment does not identify any likely significant effects as a result of measures embedded in the design of the Scottish Onshore Scheme or standard mitigation applied during its construction, however, additional mitigation is also proposed to avoid or further reduce the risk of potential impacts.

Key mitigation measures include the design of the Scottish Onshore Scheme seeking to avoid potentially contaminated land as much as possible through route and site selection, the proposed use of Horizontal Directional Drilling (HDD) to avoid impacts on designated geological sites along the coastline as well as following a range of good practice measures during construction. While there is the potential to encounter contamination a range of measures are proposed to ensure it is identified, handled and disposed of such that it will not affect the environment or human health.

Overall, the likely effects of the Scottish Onshore Scheme are assessed as negligible to minor Adverse and therefore are not significant.

4.9 Climate Change

The assessment of climate change considers the likely significant effects of greenhouse gas (GHG) emissions arising from the Scottish Onshore Scheme on climate. Although the Scottish Onshore Scheme will result in increased GHG emissions during construction these are minor adverse and not significant. The assessment highlights the Scottish Onshore Scheme's role in wider UK and Scottish policy to decarbonise the electricity grid. The Scottish Onshore Scheme will support the ongoing expansion of renewable energy generation within the UK energy system by providing the necessary infrastructure to support the increased transmission of renewable and low-carbon electricity. This will contribute to the decarbonisation of the electricity generation sector as renewables increasingly replace higher-carbon energy sources.

5. Summary and Next Steps

5.1 Summary of Assessment

The EIA of the Scottish Onshore Scheme has identified and assessed the likely significant effects which would result from its construction and operation. Through careful routing and siting and including mitigation within the design and construction of the Scottish Onshore Scheme, the majority of likely significant environmental effects have been prevented, avoided or reduced. While some significant effects have been identified these are limited to temporary effects on visual amenity and as result of noise during construction. One significant effect will occur on a visual receptor during year 1 for road users of a short section of the B9097 as a result of the operation of the Scottish Onshore Scheme.

The table below sets out the results of the assessment taking into account embedded and additional mitigation. The table denotes significant effects occurring where that assessment has identified at least one significant residual effect.

Environmental Aspect	Converter Station		Underground Cable inc. landfall	
	Construction Effects	Operational Effects	Construction Effects	Operational Effects
Landscape and Visual Amenity	X	X	X	Scoped out
Ecology and Nature Conservation	O	O	O	O
Water Environment and Flood Risk	O	O	O	O
Cultural Heritage	O	O	O	O
Access, Traffic & Transport	O	Scoped out	O	Scoped out
Noise	O	O	X	Scoped out
Geology and Ground Conditions	O	O	O	O
Climate Change	O	O	O	O
Key: O = No significant impacts recorded; X = One or more significant impacts recorded				

5.2 Next Steps

The findings of the EIA will be considered by Fife Council as part of the decision to grant or refuse planning permission for the Scottish Onshore Scheme. As described within this Non-Technical Summary one of the key aims of the EIA is to ensure that the likely significant

environmental effects of the Scottish Onshore Scheme are known and understood so that these may be considered alongside other factors before deciding whether or not to grant planning permission. In considering the planning application, Fife Council will consult with a range of organisations including Nature Scot, Historic Environment Scotland and the Scottish Environment Protection Agency (SEPA) as well as invite comments from the local community.

Should planning permission be granted, construction of the Scottish Onshore Scheme is likely to commence in 2027.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion.

As the world's population grows, the demand for food and other resources will increase. This will put pressure on the environment and on the world's food supply.

One way to meet this demand is to increase the amount of food that is produced. This can be done by using more land for agriculture, or by increasing the productivity of the land that is already being used.

Another way to meet this demand is to reduce the amount of food that is wasted. This can be done by improving the way that food is stored and distributed, or by changing the way that people eat.

There are many other ways to meet this demand, and it is important that we find ways to do so that do not harm the environment or the world's food supply.

One of the most important things we can do is to make sure that we have enough food to eat. This means that we need to make sure that we have enough land for agriculture, and that we have enough water to grow crops.

We also need to make sure that we have enough food to eat that is healthy and nutritious. This means that we need to make sure that we have enough food that is safe to eat, and that we have enough food that is good for us.

There are many other things we can do to make sure that we have enough food to eat, and it is important that we do so. This is because food is one of the most basic needs that we have, and it is something that we need to live.

So, let's make sure that we have enough food to eat. This means that we need to make sure that we have enough land for agriculture, and that we have enough water to grow crops.

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