Scottish & Southern Electricity Networks

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Consultation Document

Project: LT337 Tangy IV Wind Farm Connection

Date: August 2022

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CONTENTS

Scottish & Southern Electricity Networks
TRANSMISSION

Appendices

Appendix 1 – Figures

Appendix 2 – OHL Route Options and Site Options Summary RAG Tables

Figures

Figure 1.1 – Location

Figure 3.1 – Study Area

Figure 3.2 – Route Options

Figure 5.1 – Key Constraints

Figure 6.1 – Preferred Route

Figure 7.1 – Site Selection Study Location

Figure 7.2 – Site Options

Figure 7.3a – Site Options – Natural Heritage Constraints

Figure 7.3b – Site Options – Cultural Heritage and Landscape Constraints

Figure 7.3c – Site Options – Woodland Constraints

Figure 7.3d – Site Options – Recreation and Proposals Constraints

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GLOSSARY

Term	Definition
Alignment	A centre line of an overhead line (OHL), along with location of key angle structures.
Amenity	The natural environment, cultural heritage, landscape and visual quality. Also includes the impact of SSEN Transmission's works on communities, such as the effects of noise and disturbance from construction activities.
Area of Search	The Area of Search is a broad geographical area within which possible sites might be capable of identification within approximately 5 km of the required connectivity point. This is the area in which the site selection takes place.
Conductor	A metallic wire strung from structure to structure, to carry electric current.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views and, normally, with the objective of influencing decisions, policies or programmes of action.
Corridor	A linear area which allows a continuous connection between the defined connection points. The corridor may vary in width along its length; in unconstrained areas it may be many kilometres wide.
Environmental Impact Assessment (EIA)	Environmental Impact Assessment. A formal process codified by EU directive 2011/92/EU, and subsequently amended by Directive 2014/52/EU. The national regulations are set out in The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. The EIA process is set out in Regulation 4(1) of the regulations and includes the preparation of an EIA Report by the developer to systematically identify, predict, assess and report on the likely significant environmental impacts of a proposed project or development.
Gardens and Designed Landscapes (GDLs)	The Inventory of Gardens and Designed Landscapes lists those gardens or designed landscapes which are considered by a panel of experts to be of national importance.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities.
Kilovolt (kV)	One thousand volts.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A – C.
Micro-siting	The process of positioning individual structures to avoid localised environmental or technical constraints.
Mitigation	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
National Scenic Area (NSA)	A national level designation applied to those landscapes considered to be of exceptional scenic value.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel towers or poles.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Riparian Woodland	Natural home for plants and animals occurring in a thin strip of land bordering a stream or river.
Route	A linear area of approximately 1 km width (although this may be narrower/wider in specific locations in response to identified pinch points / constraints), which provides a continuous connection between defined connection points.
Route (preferred)	A route for the OHL taken forward to stakeholder consultation following a comparative appraisal of route options.
Route (proposed)	A route taken forward following stakeholder consultation to the alignment selection stage of the overhead line routeing process.

Term	Definition
Routeing	The work undertaken which leads to the selection of a proposed alignment, capable of being taken forward into the consenting process under Section 37 of the Electricity Act 1989.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Semi-natural Woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition
Site of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain.
Span	The section of OHL between two structures.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 79/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981.
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission works.
Study Area	The area within which the corridor, route and alignment study takes place.
Volts	The international unit of electric potential and electromotive force.
Wild Land Area (WLA)	Those areas comprising the greatest and most extensive areas of high wildness. It is not a statutory designation, but WLAs are considered nationally important.

PREFACE

This Consultation Document has been prepared by WSP UK Ltd. on behalf of Scottish and Southern Electricity Networks Transmission (SSEN Transmission) to seek comments from all interested parties on the Preferred Route identified for the proposed Tangy IV Wind Farm Connection between the Tangy IV Wind Farm Substation and a connection point near the existing Crossaig to Carradale 132 kV OHL.

The Consultation Document is available online at the project website:

https://www.ssen-transmission.co.uk/projects/tangy-iv-wind-farm-connection-project

A face to face public consultation event will be held between 2pm to 7pm on 23rd August 2022 at Campbeltown Town Hall, 54 Main Street, Campbeltown, Argyll, PA28 6AB.

To continue engagement on the project SSEN Transmission has developed an online consultation tool, to enable the local community to experience the full exhibition from home on a computer, tablet or mobile device. The online exhibition has been designed to look and feel like a real consultation in a community hall, with exhibition boards, maps, interactive videos and the opportunity to share views on the proposals.

Visitors will be able to engage directly with the project team, via a live chat function, where they can ask any questions they might have about the project and share their feedback on the current proposals.

The virtual consultation event will be taking place week commencing 29th August 2022 via the project website.

Comments on this Consultation Document should be sent to:

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All comments are requested by 23rd September 2022.

EXECUTIVE SUMMARY

Scottish and Southern Electricity Network Transmission is proposing to construct a new 132 kilovolt overhead line between Tangy IV Wind Farm Substation and a connection point near the existing Crossaig to Carradale 132 kV overhead line. As part of this, a new switching station or extension of the Carradale Grid Supply Point is also required to create a transmission connection between the Tangy IV Wind Farm Connection and the existing Crossaig to Carradale 132 kV overhead line. The switching station or extension of Carradale Grid Supply Point will be used to connect the new Tangy IV Wind Farm to the grid whilst ensuring all relevant protection equipment is installed in the event of a fault.

The developer of Tangy IV Wind Farm has submitted an application to the Scottish Government under Section 36 of the Electricity Act 1989 for a 100 megawatt Wind Farm and has a contracted connection date of April 2027. Under the terms of their license, SSEN Transmission is therefore obliged to connect the developer to the transmission network by the contracted connection date.

Route Options were identified, which provided feasible areas for the overhead line to be developed, and from a which a Preferred Route has been selected that provides an optimum balance of environmental, engineering and economic factors. Site Options were also identified for the proposed switching station from which a Preferred Site has been selected giving the same consideration for environmental, engineering and economic factors. This Consultation Document invites comments from all interested parties on the Preferred Route and Preferred Site.

Moving forward, confirmation of the Preferred Route and Preferred Site will be informed by this consultation exercise and through detailed surveys, which may identify any as yet unknown engineering, environmental or land use constraints. Subject to the outcome of the consultation, the Preferred Route will then be referred to as the Proposed Route. We will seek potential alignments within it, which will then be subject to further appraisal and consultation. On identification of a Proposed Alignment (after further consultation), Section 37 consent under the Electricity Act 1989 will be sought from the Energy Consents Unit of the Scottish Government for proposed new overhead line infrastructure.

Further public consultation on a Preferred Alignment will take place by Spring 2023. It is anticipated that an application for consent for a Proposed Alignment will be submitted in Winter 2023.

When providing comments and feedback on this Consultation Document, SHE Transmission would be grateful for your consideration of the questions below:

- Has the need for the Project been adequately explained?
- Has the approach taken to select the Preferred Route been adequately explained?
- Are there any factors, or environmental features, that you consider may have been overlooked during the Preferred Route selection process?
- Do you feel, on balance, that the Preferred Route selected is the most appropriate for further consideration at the alignment selection stage? Please provide an explanation of your answer.
- If you don't agree to our Preferred Route which of the options would you consider the best option for SSEN Transmission to develop? Please provide an explanation of your answer.

1. INTRODUCTION

1.1 Purpose of the Document

The Consultation Document invites comments from all interested parties on the Preferred Route identified for the new 132 kilovolt (kV) overhead line (OHL) between the Tangy IV Wind Farm Substation and a connection point near the existing Crossaig to Carradale 132 kV OHL north of Carradale (see **Figure 1.1**), a distance of approximately 21.5 kilometres (km) (hereafter referred to as the 'Proposed Development'). It also invites comments on the Preferred Site of a new switching station or extension of the Carradale Grid Supply Point (GSP) to create a transmission connection between the Tangy IV Wind Farm 132 kV OHL and a connection point near the existing Crossaig to Carradale 132 kV OHL.

This Consultation Document describes the findings of and environmental, engineering and economic appraisal of five Route Options identified by SSEN Transmission, and present the process by which a Preferred Route for the OHL has been selected. The Preferred Route is considered to provide the optimal opportunity to achieve an economically viable, technically feasible and environmentally sound alignment within it. The Consultation Document also provides a summary of the Initial Site Selection Report[1]. Comments are now sought from statutory authorities, key stakeholders, elected representatives and the public on the route selection process and the Preferred Route and Preferred Site identified.

All comments received will inform further consideration of the Preferred Route and Preferred Site, and subsequent alignment options therein.

1.2 Document Structure

This report is comprised of eight sections as follows:

1) Introduction – setting out the purpose of the Consultation Document;
2) The Proposals – describes the need for the proposals, the proposed technology solution and the typical construction methods;
3) Route Selection Process – sets out the route selection process and methodology that has been applied to date to derive a Preferred Route;
4) Description of the Route Options – describes the Route Options that have been identified;
5) Baseline Conditions – describes the local context and baseline environmental and engineering conditions;
6) Comparative Appraisal – analyses each Route Option against a series of environmental, technical and economic considerations to arrive at a recommendation for the Preferred Route;
7) Initial Site Selection Report Summary – summarises the Initial Site Selection report including, the need for the new switching station or Carradale GSP extension, a description of the Site Options, baseline conditions, comparative appraisal of each Site Option and the Identification of a Preferred Site; and
8) Consultation on the Proposals – invites comments on the route assessment process and identification of Preferred Route.

The main body of this document is supported by a series of figures (see **Appendix 1**).

[1] SSEN Transmission plc (August 2022) LT337 Tangy IV Wind Farm Connection Initial Site Selection Report.

1.3 Next Steps

As part of the consultation exercise, comments are sought from members of the public, statutory consultees and other key stakeholders on the Preferred Route and Preferred Site recommended.

A Report on Consultation will be produced which will document the consultation responses received, and the decisions made in light of these responses.

Following the identification of a Proposed Route and Proposed Site, further technical and environmental surveys will be undertaken to identify a preferred alignment within the route. Consultation on a Preferred Alignment will be undertaken during Spring 2023.

2. THE PROPOSALS

2.1 The Need for the Project

SSEN Transmission is a wholly owned subsidiary of the SSE plc Group of companies. SSEN Transmission holds a license under the Electricity Act 1989 for the transmission of electricity in the north of Scotland and has a statutory duty under Schedule 9 of the Electricity Act 1989 to *'develop and maintain an efficient, co-ordinated and economical electricity transmission system in its licensed areas'.*

The developer of Tangy IV Wind Farm has submitted an application to the Scottish Government under Section 36 of the Electricity Act 1989 for a 100 megawatt (MW) Wind Farm and has a contracted connection date of April 2027. Under the terms of their license, SSEN Transmission is therefore obliged to connect the developer to the transmission network by the contracted connection date.

The requirement for the switching station is to create a central node on the network where multiple lines of the same voltage can connect. Switches at this location allow each line in and out to be controlled without affecting the other lines. In this instance, the switching station is required to connect the proposed OHL from the Tangy IV Substation to the existing Crossaig to Carradale 132 kV OHL and subsequently to the UK electricity network.

2.2 Alternative Options and Preferred Technology Solution

For a connection of this length and scale an underground cable is not a feasible option due to costs involved during construction as well as ongoing maintenance problems associated with underground cables in remote areas including terrain, access and the presence of watercourses and associated flood zones, potential undesignated assets and peat. As such, all options explored were OHL routes and the options considered were the connection point of the OHL into three existing assets.

The first option, which was taken forward to further development, was the T in option[2] into the existing Crossaig to Carradale 132 kV OHL. The second option was to install a new 132 kV busbar at Carradale GSP which was also taken forward to further development. The third option was to have a direct connection into the Crossaig 132/275 kV substation. Option 3 was also discounted due to the length of the required OHL route being in excess of 30 km which would nearly double the costs involved whilst also having a greater visual impact for the local residents and users of the local area. As such, both option 1 and option 2 have been assessed within the site selection process which is outlined later in this report and option 2 is being taken to detailed design as this provides the least cost option whilst also reducing construction time and land use.

2.3 Proposals Overview

SSEN Transmission is proposing to construct a new 21.5 km 132 kV OHL, which will be supported on wooden pole tridents, between the Tangy IV Wind Farm Substation and a connection point near the existing Crossaig to Carradale 132 kV OHL. Steel lattice towers may also be required; however, this will be confirmed at the alignment stage. For the purposes of this report, it is assumed that the Proposed Development would comprise both wooden trident poles and steel lattice towers.

Generally, the height, including extensions, for the wooden poles is 11-17 m and for L4 steel lattice towers between 26-44 m. The selection of the supports suitable for the OHL are being considered separately to the OHL routeing process.

[2] A T-point is a connecting point of one overhead line into another, forming a T shape and hence the name.

The final designation of support type is generally dependent on three main factors: altitude, weather and the topography of the route. The size of supports and span lengths will also vary depending on these factors, with supports being closer together at high altitudes to withstand the effects of greater exposure to high winds, ice and other weather events. The support configuration, height and the distance between supports will therefore only be fully determined after a detailed alignment survey.

The proposed wooden trident poles will support three conductors (wires) on three insulators positioned at the top of the pole. The L4 steel lattice towers will support six conductors (wires) on six cross-arms (three on each side) and an earth wire between the peaks. Typical designs for both structures can be seen in **Plate 2.1** and **Plate 2.2**.

Plate 2.1 – Typical wooden trident pole design

Plate 2.2 – Typical L4 steel lattice tower design

Construction Activities

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

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

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

2.3.1 Forestry Removal

Any woodland removal which may be required prior to the construction work will be identified and described after a proposed alignment has been identified. Any removal of sections of commercial forest would be undertaken in consultation with Scottish Forestry and affected landowners. After felling, any timber removed that is commercially viable would be sold and the remaining forest material would be dealt with in a way that delivers the best practicable environmental outcome and

is compliant with waste regulations. The methods of woodland removal and management of timber would be described in a Woodland Management Document in-line with The UK Forestry Standard[3] guidance, to be prepared as part of the application for consent under Section 37 of the Electricity Act 1989, as amended.

2.3.2 Access during Construction

Vehicle access is required to each support structure location during construction to allow excavation and creation of foundations and erection of the support structure. Existing tracks would be used where possible. Preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary track solutions in boggy / soft ground areas to reduce any damage to, and compaction of, the ground. These journeys would be kept to a minimum to minimise disruption to habitats along the route. However, temporary stone tracks are likely to be necessary in some areas depending on existing access conditions, terrain and altitude. A more detailed plan for access during construction will be prepared once a proposed alignment has been identified and the preferred support structure type selected.

Access requirements for the Proposed Development will be dependent upon the type of OHL supports chosen. Consideration of impacts will be undertaken at the alignment stage once the support type has been confirmed. However, permanent access to angle / tension pole and tower positions would be desirable for operational and management purposes and for storm control. A more detailed plan for access during construction will be prepared once a Proposed Alignment has been identified and the type of support structure has been selected.

2.3.3 Indicative Programme

It is anticipated that construction of the Proposed Development would take place over an 18 – 22 month period, following the granting of consents, although a detailed programming of works would be the responsibility of the Principal Contractor in agreement with SSEN Transmission. Construction is estimated to start in June 2025 with completion in February 2027.

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

3. ROUTE SELECTION PROCESS

3.1 Guidance Document

The approach to route selection, in identifying and assessing alternative OHL routes, is informed by SSEN Transmission's Routeing Guidance[4]. The guidance develops a process which aims to balance environmental, engineering and economic considerations throughout the Route Options process.

This report summarises the process of Stage 2: Route Selection from the guidance[4], which seeks to find a Proposed Route which, where possible, avoids physical, environmental and amenity constraints, is likely to be acceptable to stakeholders, and is economically viable, taking into account factors such as altitude, slope, ground conditions and access.

In consideration of these principles, the method of identifying a Preferred Route in this study has involved the following four key tasks:

- Identification of the baseline situation;
- Identification of alternative Route Options;
- Environmental analysis of Route Options; and
- Identification of a Preferred Route.

On finalisation of the Route Selection (Stage 2) process, SSEN Transmission's Routeing guidance[2] will be followed as the project progresses through Alignment Selection (Stage 3) and onto the Consenting Process (Stage 4).

3.2 Area of Search

A preliminary environmental Study Area was identified within which the identification and assessment of Route Options could be completed (see **Figure 3.1**). This Study Area encompassed a range of feasible Route Options between Tangy IV Wind Farm Substation in the south west and the existing Crossaig to Carradale 132 kV OHL in the north east.

The Study Area is largely defined by the geography of the area between the two connection points. It is constrained by areas of steep slopes and local high points. At the northern end, the Study Area extends north from the Carradale GSP to avoid areas of steep slopes west of Carradale. At the southern end, the Study Area extends south east of the Tangy IV Wind Farm Substation to the eastern coastline.

Baseline studies have been focussed within the Study Area, although consideration of potential receptors outside of this area (e.g. environmental designations, visual receptors or cultural heritage sites) has been undertaken and these are referenced where relevant in this report.

3.3 Baseline Conditions

3.3.1 Desk Study

A series of desk-based studies have been undertaken to identify a broad range of potential constraints and opportunities within the Study Area, and its adjacent context, which may be constraints to routeing.

This has included the following:

- Identification of designated sites and other constraints from GIS datasets available from the NatureScot Site Link[5];

[4] Scottish & Southern Electricity Networks, 2020. PR-NET-ENV-501: Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above.

[5] NatureScot (N/A). Site Link. [online]. Available at: https://sitelink.nature.scot/home (Accessed 8 February 2022).

- Identification of archaeological designations and other recorded sites, using GIS datasets available from Historic Environment Scotland[6] [7];
- Review of the Argyll and Bute Local Development Plan (2015)[8] and Argyll and Bute Local Development Plan 2 (2020)[9] to identify further environmental constraints and opportunities, such as regional level designations or other locations important to the public;
- Review of Landscape Character Assessments of relevance to the Study Area[10];
- Review of Ordnance Survey (OS) mapping (1:50,000 and 1:25,000 online mapping and terrain data from OS OpenData) and aerial photography (where available) to identify other potential constraints such as settlements, properties, walking routes, cycling routes etc.;
- Extrapolation of OS OpenData to identify further environmental constraints including locations of watercourses and waterbodies and to undertake a preliminary slope analysis;
- Identification of watercourse and waterbody quality and areas prone to flooding, utilising online GIS data sources from Scottish Environment Protection Agency (SEPA)[11];
- Review of other local information through online and published media such as tourism sites and walking routes; and
- Review of ornithological data available for wind farms within a 2 km buffer of the Study Area from the Argyll and Bute planning portal[12].

3.3.2 Site Visit

Following the identification of potential Route Options (see **Section 3.4** below), site walkovers were undertaken by landscape specialists in February and March 2022 to ground truth the key constraints identified by the desk studies and where appropriate to refine the Route Options.

The landscape site walkover was undertaken on 15th and 16th February 2022, working from public roads and publicly accessible locations. The site visit primarily covered the local road network within the south of the Study Area up to Lusso Loch and some surrounding local roads however, due to poor weather conditions and visibility, the site visit was aborted. A second landscape site walkover was undertaken on the 15th to 17th March 2022 in better weather conditions and with vehicle access to forestry tracks across the Study Area. The majority of the Study Area was visited to consider the Route Options in more detail.

3.4 Route Identification and Selection Methods

3.4.1 Route Identification

Route Options (see **Figure 3.2**) were identified as part of the desk-based studies considering the most notable constraints. Consideration has included a review of the steps outlined in the Holford Rules and SSEN Transmission Routeing Guidance[4]. Whilst the routeing process was environmentally design-led, fundamental technical constraints such as terrain were considered as part of the process.

In summary, the following has been taken into account as far as is practicable at this routeing stage and will be considered in more detail during Stage 3 (Alignment Selection):

[6] Historic Environment Scotland, (N/A). Portal. [online]. Available at: http://portal.historicenvironment.scot/ (Accessed 8 February 2022).
[7] Canmore (N/A). Royal Commission on Ancient and Historical Monuments of Scotland. [online]. Available at: https://canmore.org.uk/ (Accessed 8 February 2022).
[8] Argyll and Bute Council (2015). Local Development Plan. [online]. Available at: https://www.argyll-bute.gov.uk/ldp (Accessed 8 February 2022).
[9] Argyll and Bute Council (2020.). Local Development Plan 2. [online]. Available at: https://www.argyll-bute.gov.uk/ldp2 (Accessed 8 February 2022).
[10] NatureScot (N/A). Scottish Landscape Character Type Map and Descriptions. [online]. Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions (Accessed 8 February 2022).
[11] Scottish Environment Protection Agency (N/A). SEPA Data publication. [online]. Available at: https://www.sepa.org.uk/environment/environmental-data/ (Accessed 8 February 2022).
[12] Argyll and Byte Council (N/A). Planning Portal. [online]. Available online at: https://www.argyll-bute.gov.uk/planning-and-environment/find-and-comment-planning-applications (Accessed 24 March 2022).

- Avoid if possible major areas of highest amenity value (including those covered by national and international designations and other sensitive landscapes) (Holford Rule 1). Areas considered included the eastern coast comprising National Scenic Areas (NSA) and Areas of Panoramic Quality (APQ) and the Kintyre Goose Roosts Special Protection Area (SPA) and Ramsar site, and Kintyre Goose Loch Site of Special Scientific Interest (SSSI);
- Avoid by deviation, smaller areas of high amenity value such as regional scenic areas;
- Other things being equal, try to avoid sharp changes of direction and reduce the number of larger angle towers required (Holford Rule 3);
- Avoid skylining the route in key views and where necessary, cross ridges obliquely where a dip in the ridge provides an opportunity (Holford Rule 4);
- Avoid the highest terrain, where climatic conditions can impose extra loading (wind and ice) on OHL conductors (technical constraint that aligns with the second part of Holford Rule 4, land over 500 m avoided where possible, over 600 m avoided absolutely);
- Target the route towards moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees (avoid slicing through landscape types and try to keep to edges and landscape transitions) (Holford Rule 5);
- Consider construction access and the availability of existing roads and tracks;
- Consider the appearance of other OHLs in the landscape to avoid a dominating or confusing wirescape effect; and
- Consider technical issues related to crossing the existing OHL alignment, clearances, connectivity, outages, maintenance and faults.

3.4.2 Route Options

Route Options were identified as shown on **Figure 3.2**.

The Route Options were initially identified at 1 km widths along areas where it was considered feasible to accommodate the Proposed Development e.g. in parallel with roads or existing accesses for ease of access and through existing gaps in forestry to minimise felling requirements. Route Options were then refined, narrowing in places to avoid baseline constraints and widening to allow for subsequent identification of alignments during the next stage of the process (Stage 3).

At this stage, two transition points identified as 'nodes' have been illustrated within the north of the Study Area. These nodes reflect the potential for crossing between Route Options, enabling the routes to be switched between the Zones:

- Zone A, north of Tangy to Arnicle;
- Zone B, east of Arnicle to Clach Bhealaich; and
- Zone C, east of Clach Bhealaich to the B842 between Carradale and Lag Kilmichael.

Two additional routes have been identified which present one Route Option from end to end. These Route Options will be appraised against the preferred combination of Route Options across Zones A, B and C. These additional routes are identified as:

- Route D, north east of Tangy, east to Saddell and north to Carradale; and
- Route E, south of Tangy, east to the B842 and north to Carradale.

The Route Options are described in detail in **Section 4**, below.

3.5 Appraisal Method

Appraisal of the Route Options has followed the process defined by SSEN Transmission's Routeing Guidance[4], including the environmental topics considered within. As stated above, for ease of

assessment and interpretation, the Study Area has been divided into three zones and two routes. Below is a list of the topic areas considered as part of the Route Options appraisal.

3.5.1 *Environmental Criteria*

Appraisal of Route Options has involved systematic consideration against the following environmental topic areas:

- Natural Heritage - designations; protected species; habitats; biodiversity; ornithology; geology, hydrogeology and hydrology;
- Cultural Heritage - designations; cultural heritage assets;
- People – proximity to dwellings;
- Landscape – designations; landscape character; visual;
- Land Use – agriculture; forestry; recreation;
- Planning – policy, proposals.

3.5.2 *Engineering Criteria*

Appraisal of Route Options has involved systematic consideration against the following engineering topic areas:

- Infrastructure Crossings – major crossings (132 kV, 275 kV, Rail, 200+m wide river, navigable canal, gas or hydro pipeline); road crossings;
- Environmental Design – elevation; atmospheric pollution; contaminated land; flooding;
- Ground Conditions – terrain; peat;
- Construction / Maintenance – access; angle towers; and
- Proximity – clearance distance; wind farms, communication masts, urban environments; metallic pipelines.

3.5.3 *Economic Criteria*

Appraisal of Route Options has involved systematic consideration against the following economic topic areas:

- Capital – construction; diversions; public road improvements; tree felling; land assembly; consent mitigations; and
- Operational – inspections; maintenance.

3.5.4 *Comparative Appraisal*

Each Route Option has been considered in terms of its potential interaction with the environmental, engineering and economic characteristics, features and sensitivities. The Route Options have then been compared to determine which has the greatest and least capacity or potential to accommodate the Proposed Development.

In line with the RAG assessment criteria defined within the SSEN Transmission Guidance, a RAG rating has been applied to each topic area within each Route Option. This rating is based on a three-point scale as indicated in **Table 3.1** below[4].

Table 3-1: RAG Ratings

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

3.5.5 *Identification of a Preferred Route*

The overall objective throughout the appraisal of Route Options has been to take full consideration of all environmental factors to minimise any potential adverse impacts on the environment whilst taking into account engineering and economic considerations. Following a review and consideration of the potential route options, a Preferred Route Options was arrived at.

4. DESCRIPTION OF THE ROUTE OPTIONS

4.1 Identification of Sections and Route Options

The Study Area was divided into five sections, for ease of comparative appraisal, from A to E for the definition of Route Options:

- Zone A, north of Tangy to Arnicle;
- Zone B, east of Arnicle to Clach Bhealaich;
- Zone C, east of Clach Bhealaich to the B842 between Carradale and Lag Kilmichael;
- Route D, north east of Tangy, east to Saddell and north to Carradale; and
- Route E, south of Tangy, east to the B842 and north to Carradale.

Route Options have been defined to allow for subsequent identification of alignments during the next stage of the process (see **Figure 3.2**). Two nodes have also been identified as transition points between the Route Options in Zones A to C which are described below. The Route Options are as follows:

4.1.1 Zone A – north of Tangy to Arnicle

Route Option A1 has been proposed as there are limited constraints along the west and north boundaries of the Study Area. The route would travel north along the woodland edge on the lower slopes, above the western coastal edge of Kintyre. Near Glenbarr, the route would turn north east, running along the slopes above the Barr Water. Route Option A1 would meet the node at the Abhainn a Chnoicain water course at Arnicle. Route Option A1 is approximately 11 km in length.

Route Option A2 travels north east from Tangy IV Wind Farm substation around the lower slopes of Cnoc Buidhe (312 m Above Ordnance Datum (AOD)), and travelling along a shallow valley. The route then heads north, along the Allt nan Calltuinn water course, crossing the centre of the Study Area, to the west of the existing Beinn an Tuirc Wind Farm, before joining the node at Arnicle. Route Option A2 is approximately 8 km in length.

4.1.2 Zone B – east of Arnicle to Clach Bhealaich

Route Option B1 would continue to stretch north east from Route Option A1, traversing through an area of steep terrain north of Beinn Bhreac. The route would extend east to an additional node north of Clach Bhealaich where there is an opportunity for the route to pass around the Beinn Bhreac hilltop (425 m AOD) to the south and join Route Option C2 (described below). Route Option B1 is approximately 4 km in length.

Route Option B2 would continue from Route Option A2 to stretch east of Arnicle, through shallow valleys, avoiding areas of steep slopes at Beinn Bhreac within the north. The route would pass north of the existing Beinn au Tuirc Wind Farm and continue east to join the node at Clach Bhealaich. Route Option B2 is approximately 4.4 km in length.

4.1.3 Zone C – east of Clach Bhealaich to the B842 between Carradale and Lag Kilmichael

Route Option C1 would continue from the node north of Clach Bhealaich in a north east direction, traversing steeper slopes in the north eastern extent of the Study Area at Lag Kilmichael. Route Option C1 would then turn south travelling in parallel to existing Crossaig to Carradale 132 kV OHL before connecting into a connection point near the existing Crossaig to Carradale 132 kV OHL, north of the Carradale GSP. Existing underground cables run parallel to the B842 at the eastern extent of this Route Option. Route Option C1 is approximately 5.9 km in length.

Route Option C2 would continue east from the node at Clach Bhealaich, along the rocky hilltops and steep terrain before crossing the Carradale Water valley to a connection point near the existing Crossaig to Carradale 132 kV OHL at Carradale. Route Option C2 is approximately 3.7 km in length.

4.1.4 *Route D – north east of Tangy, east to Saddell and north to Carradale*

Route Option D presents a continuous route from Tangy IV Wind Farm Substation to Carradale GSP. This Route Option would initially follow the same route as Route Option A2, north east of the proposed Tangy IV Wind Farm, running through shallow valleys. Instead of heading north at Collusca, the route would continue east, running in the same direction as the Kintyre Way to Creag Thormaic. The route would be retained to valley edges in order to avoid steep slopes where possible. The route would then extend east to the B842 at Saddell and follow the road infrastructure north along the coast to the connection point at Carradale GSP. Route Option D is approximately 17.2 km in length.

4.1.5 *Route E – south of Tangy, east to the B842 and north to Carradale*

Route Option E presents a continuous route from Tangy IV Wind Farm Substation to Carradale GSP. This Route Option would follow a route south east of the proposed Tangy IV Wind Farm, passing an area of existing underground cables at Gobagrennan, and then following along the existing woodland edge and existing 33 kV OHL to meet the B842 on the east coast. The route would follow the existing infrastructure line along the coast in a northern direction and meet the connection point at Carradale GSP in the north. Route Option E is located adjacent to the East Kintyre Area of Panoramic Quality and is the longest route proposed with a total length of approximately 22.5 km.

4.1.6 *Nodes*

The two nodes between Zones A, B and C will allow a combination of the separate sections of the zones to be considered following assessment of each part, as different parts of each zone may be preferrable. This has been used to determine the preferred combination of Route Options across the three zones. This preferred combination has been appraised against Route Options D and E.

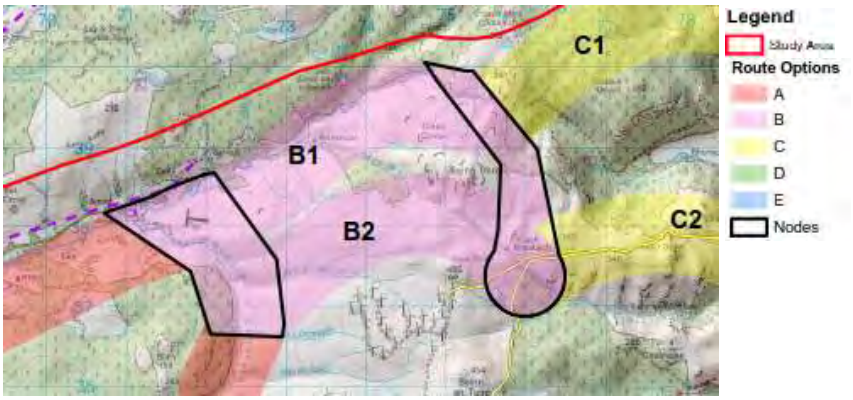


Plate 4.1: Nodes between Zones A, B and C

For the purpose of comparative appraisal, the area within the nodes has been considered for all environmental topics as part of the relevant Route Options to ensure that all constraints information is captured. However, in order to enable comparative appraisal of each Route Option for the BNG assessment, the boundaries of the Route Options and nodes have been amended to avoid overlap which would have otherwise resulted in duplication of Biodiversity Units (BU) and irreplaceable habitat values. Consequently, the nodes have been separated into six sections as shown in Plate 5.2 below. The boundaries for the nodes as illustrated in **Plate 4.2** have been used for the BNG assessment only.

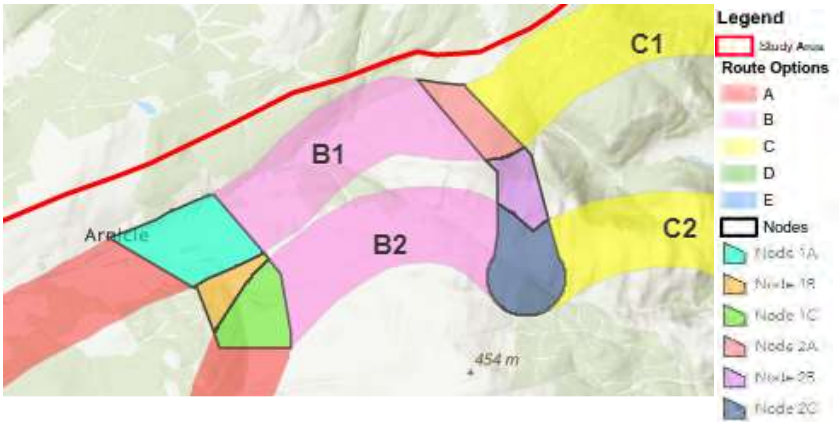


Plate 4.2: Nodes between Zones A, B and C for BNG Assessment

5. BASELINE CONDITIONS

5.1 Introduction

This section summarises the baseline information for the key environmental and engineering constraint types and their associated topics relevant to the Proposed Development, as listed in **Table 3.1** (above).

5.2 Environmental Constraints

This section summarises the baseline information and key constraints for each of the environmental topics relevant to the Proposed Development. **Figure 5.1** shows the key constraints within the Study Area.

5.2.1 *Natural Heritage*

Designations

A summary of statutory designated sites which occur within 2 km of the Route Options and non-statutory designations which occur within 1 km of the Route Options are outlined in **Table 5-1.** Additionally, there are a further 16 International / European statutorily designated-sites between 1 km and 20 km of the Route Options which are outlined in **Appendix 2 – Environmental Route Options Appraisal Report** (**Appendix 3**).

Table 5-1 Statutory Designated Sites within 2 km and Non-Statutory Designated Sites within 1 km

Designation / Type	Statutory / Non-Statutory	Name of Designation
SSSI (biological)	Statutory	Tangy Loch
SSSI (biological)	Statutory	Kintyre Goose Lochs
SSSI (geological)	Statutory	Bellochantuy and Tangy Gorges
SSSI (geological)	Statutory	Glenacardoch Point
SSSI (biological)	Statutory	Torrisdale Cliff
SPA (biological)	Statutory	Kintyre Goose Lochs
SPA (biological)	Statutory	The Sound of Gigha
Ramsar (biological)	Statutory	Kintyre Goose Roosts
Local Nature Conservation Site (LNCS)	Non-statutory	Various
Geological Conservation Review (GCR) Site	Non-statutory	Glenacardoch Point
GCR Site	Non-statutory	Tangy Glen
Ancient Woodland	Non-statutory	Various
Native Woodland	Non-statutory	Various

Protected Species

An ecological desk study identified records of several European Protected Species (EPS), protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended)[13], those identified as priority species on the Scottish Biodiversity List[14] (SBL) and / or protected under national legislation such as the Wildlife and Countryside Act 1981[15] as amended (WCA) or Protection of Badger Act 1992[16] (PBA). The identified species / species groups include:

- Bats (EPS and SBL);
- Badger (PBA);
- Red squirrel (WCA and SBL);
- Pine marten (WCA and SBL);
- Otter (EPS and SBL);
- Water vole (WCA and SBL);
- Reptiles (WCA and SBL);
- Amphibians (EPS and SBL); and
- Fish (SBL).

Habitats

The Study Area contain large areas of plantation coniferous woodland in various stages of management, over valleys and hillsides and open habitats present between the plantations and on the slopes of hills. On review of the Habitat Map of Scotland dataset[17] these habitats will likely comprise bog, heath and upland acid grassland. In the flatter higher areas, wet heaths, peat, raised and blanket bogs are likely to be prevalent. Towards the coastlines both in the east and west, agriculturally-improved arable and pasture land is more common. Some of these habitats, particularly wet / dry heath and blanket bog will likely constitute Annex 1 habitats designated under the Habitats Directive. Habitats within the Study Area have the potential to comprise Ground Water Dependent Terrestrial Ecosystems (GWDTE) with SEPA guidance identifying acid grassland and wet heath as having moderate potential to support GWTDE[18].

Numerous burns and rivers including Barr Water, Carradale Water and Saddell Water in the north west, north east and east of the Study Area, respectively flow through valleys within the Study Area. There are several lochs within the Study Area including Tangy Loch, Lussa Loch and Loch Arnicle. Some open areas are likely to be subject to sheep grazing and deer browsing. There could potentially be invasive and non-native plant species (including rhododendron) in varying in abundance throughout the Study Area.

A high-level Biodiversity Net Gain (BNG) assessment of the identified Route Options within the Study Area has been undertaken following the guidance outlined within SSEN Transmission's Biodiversity Net Gain Toolkit User Guide and the SSEN Transmission Assessment Methodology & Associated Guidance. The BNG assessment included a calculation of baseline BUs for each Route Option and

[13] The Conservation (Natural Habitats, &c.) Regulations 1994. [online] Available at: *https://www.legislation.gov.uk/uksi/1994/2716/contents/made* (Accessed 11 March 2022).

[14] The Scottish Biodiversity List is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, as required by the Nature Conservation (Scotland) Act 2004.

[15] Wildlife and Countryside Act 1981. [online]. Available at: https://www.legislation.gov.uk/ukpga/1981/69 (Accessed 11 March 2022).

[16] Protection of Badger Act 1992. [online]. Available at: https://www.legislation.gov.uk/ukpga/1992/51/contents (Accessed 11 March 2022).

[17] NatureScot (N/A). Habitat Map of Scotland dataset. [online]. Available at: https://www.nature.scot/landscapes-and-habitats/habitat-map-scotland (Accessed 24 March 2022).

[18] SEPA (2017). SEPA Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. [online]. Available at: lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf (Accessed 11 March 2022).

provides recommendations for Stage 3 with regards to BNG. The outputs of the BNG assessment relevant for each Route Option is included within **Appendix 2 – Environmental Route Options Appraisal Report** (**Appendix 5**).

Ornithology

A review of planning application documents for wind farm developments within 2 km of the Study Area was undertaken to inform the ornithology baseline with the most recent surveys undertaken in 2017. A number of Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or red listed Birds of Conservation Concern (BoCC) were recorded[19]. Species recorded included golden eagle *Aquila chrysaetos* along with moorland / heath dwelling species such as black grouse *L. tetrix brittanicus*, hen harrier *Circus cyaneus,* curlew *Numenius arquata* and short-eared owl *Asio flammeus*. Waterbodies within the Study Area have also been found to support Greenland white-fronted goose *Anser albifrons flavirostris* and red-throated diver *Gavia stellata* with foraging Greenland white-fronted goose recorded on arable / pasture land on the north western edge of the Study Area. In general, the Study Area offer suitability to support a range of ground nesting birds amongst long vegetation and aerially nesting birds within woodland habitats as well as lochans and marine and coastal habitats.

Hydrology, Geology and Hydrogeology

The majority of underlying bedrock geology within the Study Area consists of the Beinn Bheula Schist Formation, the Green Beds Formation and the Ben Lui Schist Formation. Smaller areas of the Loch Tay Limestone Formation and the Bellochantuy Bay Formation also lie within the Study Area. Superficial deposits within the Study Area are primarily comprised of Devensian till (diamicton), with small areas of peat, alluvium, river terrace deposits, and marine deposits along the western coast.

The Study Area is predominantly underlain by the Southern Highland Group low productivity aquifer (small amounts of groundwater in the near surface weathered zone and secondary fractures). Areas in the southern and western extents of the Study Area are underlain by Argyll Group low productivity aquifer (small amounts of groundwater in near surface weathered zone and fractures). There are small areas in the southern extent underlain by Arbuthnott-Garvock Group moderately productive aquifer (sandstones, in places flaggy, with siltstones, mudstones and conglomerates and interbedded lavas, locally yield moderate amounts of groundwater). A small area in the western extent is underlain by the New Red Sandstone Supergroup low productivity aquifer.

The Study Area is underlain by the Oban and Kintyre Water Framework Directive (WFD) groundwater body (ID: 150698)[20] which was classified by SEPA as having an overall status of 'Good' in 2020.

There are numerous named and unnamed watercourses throughout the Study Area, with notable larger watercourses, including Barr Water, Abhainn a Chnoeain, Carradale Water / Narachan Burn, Torrisdale Water, Saddell Water / Ifferdale Burn, Glenlussa Water (u/s (upstream) Lussa Loch) and Glenlussa Water (d/s (downstream) Lussa Loch) in the north west, north, north east, east and central / south of the Study Area, respectively. All of the larger aforementioned watercourses have been classified by SEPA under the WFD as having 'Good' overall status in 2020[21], with the exception of Glenlussa Water (d/s Lussa Loch), which was classified as 'Moderate' based on ecological and hydromorphological grounds.

Barr Water, Abhainn a Chnoeain, Glenlussa Water (d/s Lussa Loch) and Lussa Loch have been designated as heavily modified water bodies on account of physical alterations that cannot be

[19] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747

[20] SEPA Water Classification Hub [online]. Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/ (Accessed 11 March 2022).

[21] SEPA Water Classification Hub [online]. Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/ (Accessed 11 March 2022).

addressed without a significant impact on water storage for hydroelectricity generation, and protected habitats and species.

Private Water Supplies (PWS) are expected to be present throughout the Study Area. PWS data has been requested from Argyll and Bute Council Environmental Health Department; however, have not been received at the time of writing.

The Study Area is located entirely within a Scottish Government Drinking Water Protected Area (DWPA) for groundwater and encroaches within DWPAs for surface water in the areas surrounding Carradale, in the north east, Saddell, in the east, and Peninver, in the south east.

Habitat survey information was not available at the time of writing in order to establish potential GWDTE. Therefore, GWDTE have not been considered as part of this report. However, potential GWDTE are anticipated to be present in the vicinity of each of the Route Options and will be assessed when data becomes available.

5.2.2 *Cultural Heritage*

Designations

There are no World Heritage Sites, Inventory Battlefields or Inventory Gardens and Designated Landscapes (GDLs) within 3 km of the Route Options.

There are 45 Scheduled Monuments within 3 km of the Route Options, eight of which fall within Route Options.

There are 106 undesignated assets within the Route Options.

Cultural Heritage Assets

There are no Conservation Areas within 3 km of the Route Options.

There are 22 Listed Buildings within 3 km of the Route Options, 12 of which are located within Route Options, these comprise a single Category A, eight Category B and three Category C Listed Buildings.

5.2.3 *People*

Proximity to Dwellings

Settlement is mainly confined to the coastal edges and glen floors, with the village of Carradale, Glenbarr and Saddell located on the lower-lying land to the north east, north west and east respectively. There are however scattered residential properties in Bellochantuy, Arnicle, Killocraw, Tangy, Corrylach, Drumgarve, Ballochgair and Bunlarie.

5.2.4 *Landscape and Visual*

Designations

National Designations

There are no National Parks within 10 km of the Study Area.

The nearest NSA is the North Arran NSA, which lies some 8.5 km east of the Study Area at its closest point.

Other Nationally Important Landscapes

There are no Forest Parks within 10 km of the Study Area.

The nearest Wild Land Area (WLA) is the North Arran WLA, which lines some 9 km east of the Study Area.

There are no Inventory GDLs within the Study Area.

Regional Designations

Argyll and Bute Council have designated regionally important landscapes as APQ. Both the East Kintyre APQ and West Kintyre APQ's fall within the Study Area on the east and west coast respectively.

Landscape Character

Landscape Context

The Study Area comprises the central Kintyre Peninsula moorland plateau, hills; namely Cnoc Buidhe, Sgreadan Hill, Beinn an Tuirc and Beinn Bhreac and the surrounding coastal edges and glens of Saddell Water and Carradale Water.

The Study Area encompasses part of the coastal village of Carradale, Glenbarr and Saddell as well as scattered residential properties and Glenbarr Abbey and associated parkland, woodland and river walks. Main roads through the area include the A83 to the west and B842 to the east. The Kintyre Way and National Cycle Route (NCR) 78 run through the south and eastern part of the Study Area.

Landscape features

The Study Area contains a large number of burns, streams and the larger water courses of Barr Water, Carradale Water and Saddell Water in the north west, north east and east of the Study Area, respectively. In the south of the Study Area there are two Lochs; Lussa Loch, which is the larger of the two and Tangy Loch.

Landcover is influenced by topography and drainage. Most of the hill summits comprises of a mosaic of open moorland and forestry. The central hill summits in the north of the Study Area, such as Beinn Bhreac, Beinn an Tuirc and Braid Hill form a large area of open moorland, with forestry dominating their lower slopes to the east and west. In the southern area of the Study Area, forestry broadly dominates the network of hills, with the exception of the summits of Meall Buidhe and Sgreadan Hill, these form islands of open moorland.

The lower, more accessible slopes near the coastal edge comprise improved grassland, woodland and rocky outcrops. The glens are a neat patchwork of pastures, divided by belts of mature trees and stone walls. Hedgerows and avenues of trees tend to follow roads and lanes. Steep slopes and gullies are a mosaic of gorse and birch woodland, with scattered, stunted oak trees.

Settlement is sparse in the centre of the Study Area, there are few isolated farms, sited in sheltered positions on the edge of the high moorland. Settlement is mainly confined to the coastal edges and glen floors, with the village of Carradale, Glenbarr and Saddell located on the lower-lying land to the north east, north west and east.

Roads and infrastructure are typically located along the coastal edges of the Study Area, along the base of the hill slopes.

There are several existing OHL infrastructure corridors within the Study Area, namely along the B842. There are also several operational wind farms within the centre of the Study Area, set back from the coastal edge. The operational Beinn an Tuirc Wind Farm and extension are located within the centre of the northern part of the Study Area, between the summits of Braid Hill and Cnoc Donn. The Blary Hill Wind Farm is located within forestry in the north western part of the Study Area, around the summit of Cnoc Reamhar and Blary Hill. The in construction Beinn an Tuirc Wind Farm Phase 3 extension is located in the centre of the Study Area, to the south of Beinn an Tuirc Wind Farm and extension and located between Meall Buidhe and Sgreadan Hill. The operational Tangy I and II Wind Farms are located in the south western part of the Study Area, west of Tangy Loch. The approved Tangy IV Wind Farm will replace the existing Tangy I and II Wind Farms in the same location.

The Study Area is composed of three Landscape Character Types as defined by NatureScot's 'The Landscape of Scotland'. The LCTs within the Study Area are:

- LCT 39 – Plateau Moor and Forest;
- LCT 53 – Rocky Coastland; and
- LCT 36 – Coastal Glens.

Visual

The potential visual receptors within the Study Area have been identified as shown in **Table 5-2** below. The nature of the views available in the Study Area is generally determined by a combination of topography and forestry cover. Views of the sea and nearby islands to the west and east of the Kintyre Peninsula are available across the Study Area and the descending topography allows for scenic framings of these views.

Table 5-2 Potential Visual Receptors within the Study Area

Type of Receptor	Identified Receptor
Residential (Settlements and residences)	Villages of Carradale, Glenbarr, Saddell, Torrisdale and Peninver.
	Scattered residential properties along the A83 and B842 including Bellochantuy, Arnicle, Killocraw, Tangy, Corrylach, Drumgarve, Ballochgair and Bunlarie.
Recreational and tourist	The Kintyre Way, Section 5: Carradale to Campbelltown. National Cycle Route 78, also forms part of the Caledonia Way long distance cycle route.
	Core Path - Campbeltown to Cloanaig. Core Path - Carradale Bay circular. Core Path - Glenbarr School route.
	Numerous campsites and holiday parks predominantly located along the western coast such as Bellochantuy Beach Holiday Park and Killegruer Caravan Site.
	Visitors to cultural heritage assets such as Saddell Abbey and Glenbar Abbey.
	Numerous attractive beaches, lochs and hills which are popular amongst tourists and locals.
Transport	Main roads through the area including the A83 to the west and B842 to the east.
	Minor roads along the Glenlussa Water Valley, Saddell Water Valley and Barr Water Valley

5.2.5 *Land Use*

Agriculture

Agricultural land is predominantly a mix of Class 4.1, 4.2, 5.1, 5.2, 5.3, 6.1 and 6.3 agricultural land, classified by the Macaulay Land Use Research Institute[22]. The central area of the Study Area has been identified as Class 6.3, land capable of use as rough grazing with low quality plants with the remaining agricultural land classifications located along the coastal areas of the Study Area.

Forestry

The Study Area is located within an extensive area of woodland cover, under separate landownerships. The predominant forestry land use of the geographical area is commercial conifer, with smaller sporadic areas of native woodland. Commercial forestry timber harvesting and replanting operations through landowner forestry management are commonplace within the Study Area.

Recreation

The Study Area lies within an area of breath-taking scenery, which is of high recreational interest for walkers, cyclists, hillwalkers and equestrians. The Caledonia Way long distance route passes through

[22] The James Hutton Institute: Land Capability for Agriculture in Scotland, N/A. Land Capability for Agriculture in Scotland. [online]. Available at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland (Accessed 27 April 2022).

the Study Area following the eastern Kintyre Peninsula. National Cycle Route 78 forms part of the Caledonia Way however within the Study Area, the route is on-road (B842) and is not on the National Cycle Network. Moreover, there are numerous Core Paths within the Study Area, most notably the Campbeltown to Cloanaig Core Path which forms a section of the Kintyre Way which follows the B842 on the east coast of Kintyre, before diverging west to meet Lussa Loch and continues south to the A83.

Both Lussa Loch and Tangy Loch lie within the Study Area and are used by anglers for their populations of brown trout. The Scottish countryside is commonly used for deer stalking activities; therefore, given the rurality of the Study Area, it is assumed that deer stalking activities are undertaken in the Study Area.

5.2.6 *Planning*

Policy

The relevant Local Development Plans (LDPs) to the appraisal include the Argyll and Bute LDP, adopted in 2015, and the Argyll and Bute LDP2 which is currently being prepared and will replace the current LDP. There are numerous policies within the current and proposed LDPs on the protection of the natural and built environments that are relevant in the consideration of the development of electricity infrastructure.

Proposals

A search for other developments was undertaken on 27th May 2022 using the Argyll and Bute planning portal. This considered developments recorded within the Study Area which have been submitted or approved within the last five years. Eight submitted or approved planning applications have been identified within the Study Area; these have been summarised in **Table 5-3** below.

Table 5-3 Developments identified within the Study Area

Planning application reference	Description	Location	Status
14/01978/PP	Erection of 14 wind turbines (up to 110 metres high to blade tip), upgrading of road junction with A83T and improvements to C20. Construction of access tracks, control buildings and substation, transformers, anemometer masts and ancillary development.	Blary Hill Windfarm Land North of Loch Arnicle (including C20 to the A83T) Barr Glen by Glenbarr, Argyll and Bute	Rejected in 2015, approved on appeal in 2017
18/00034/FDP	Forest Design Plan and Screening Consultation.	West Lussa Forest, Campbeltown	Closed
18/01357/MIN	Temporary mineral working in association with windfarm development (Borrow Pit A).	Beinn An Tuirc Windfarm, Meall Buidhe	Approved
18/02014/S36	Section 36 Consultation for proposed wind farm.	Tangy Wind Farm, Kilchenzie Argyll And Bute	Unknown, no objection
19/02574/S37	33KV connection for Blary Hill Wind Farm.	Blary Hill Windfarm, Glen By Glenbarr	Prior notification, no objections
19/02577/FGS	Forest Grant Scheme.	High Ugadale Woodland Campbeltown	Prior notification, no objections
20/01212/FDP	Long term forest plan	Lagalgarve Forest, Campbeltown	Decided, permitted with conditions
21/01907/PAN	Proposal of application notice for the construction of a battery	Carradale Substation	Unknown

Planning application reference	Description	Location	Status
	storage facility up to 50MW, access track, energy storage equipment, meter building, security cameras, fencing and planting of trees.		
N/A	Proposed wind farm development of up to 40 turbines with tip heights up to 200m and an energy storage facility.	Cnoc Buidhe Wind Farm	To be submitted in 2024.

In addition to the above planning applications, an additional wind farm within the Study Area has been identified on The Scottish Government Energy Consents Unit website. A Scoping Opinion for Arnicle Wind Farm comprising 12 turbines (up to 230 m high to blade tip) with a generating capacity of up to 79.2 MW was sought in 2021. The Environmental Impact Assessment Report is currently being drafted.

5.3 Engineering Constraints

5.3.1 Infrastructure Crossings

Major Crossings and Metallic Pipes

The existing Crossaig to Carradale 132 kV OHL is located within the north east of the Study Area and a number of circuits that feed into Carradale GSP. An above ground metallic pipeline runs for approximately 3.5 km along the east of the Study Area between Cnoc nan Cadhag and Gartreillan Power Station.

Road Crossings

Road crossings include the following road classifications types, of which there are numerous located throughout the Study Area:

- A Roads i.e. A83;
- B Roads i.e. B842;
- Local roads;
- Minor roads;
- Local access roads; and
- Tracks (access and forestry).

5.3.2 Environmental Design

Elevation

Elevations within the Study Area range from sea level at Carradale to approximately 454 m AOD in the north of the Study Area at Beinn an Tuirc. However, within the Study Area the majority of Route Options are above 200 m AOD, with the exception of Route Options A1 and E that are located in the west and east of the Study Area respectively and are predominantly below 200 m AOD.

Atmospheric Pollution

The atmospheric pollution has been checked based from the data gather from National Atmospheric Emission Inventory (NAEI)[23]. The NAEI provides information on the following pollutants that are deemed to affect the performance of OHLs:

[23] National Atmospheric Emissions Inventory (N/A.) UK Emissions Interactive Map [online]. Available at: https://naei.beis.gov.uk/emissionsapp/ (Accessed 8th June 2022).

- Carbon Dioxide;
- Nitrogen Dioxide;
- Nitrogen Oxide;
- Sulphur Dioxide; and
- Particulate matters (10 um, 2.5 um, 1 um and 0.1 um).

No areas of high pollution have been identified within the Study Area.

Contaminated Land

There are no known areas of contaminated land or evidence of a risk of contaminated land identified within the Route Options. An Unexploded Ordnance (UXO) desk study and constraints assessment has been undertaken and identified a number of potential sources of UXO hazards within the Study Area. These included World War II bombing ranges, military training areas, post-war UXO finds and aircraft crash sites. For the majority of the Study Area, evidence indicates that the risk of a UXO hazard being present owing to military activity is low. However, in some discrete locations, a moderate to high UXO hazard level may exist, particularly within the boundaries of former or current military establishments such as airfields and defensive installations.

Flooding

As outlined on the SEPA flood map, areas of high risk of flooding are identified within the Study Area, most notably associated with Lussa Loch within the south of the Study Area, Carradale Water in the north east of the Study Area and Burn in the north of the Study Area. Other areas of high flood risk are located within the centre of the Study Area associated with existing waterbodies.

5.3.3 Ground Conditions

Terrain

The terrain has been assessed by reviewing the average gradient and maximum gradients of the terrain along the centre line of each Route Option using DTM data. At this stage, it is not appropriate to assess specific inclines and elevations within each Route Option. The exercise carried out at this stage assumes a full assessment of the 1 km Route Option for elevation heights and DTM data to analyse sloping scenarios would be undertaken on a Preferred Route. The terrain within the Study Area is generally steep with gradients above 40% in many areas throughout Study Area.

Peat

The British Geological website has been used to determine peat areas within the Study Area. The majority of the Study Area contains Class 5 (carbon-rich and deep peat) peat with large areas of Class 1 and Class 2 (nationally important carbon-rich soils and deep peat) peat scattered throughout the Study Area. Areas of Class 3 peat are also located within the east and north of the Study Area.

5.3.4 Construction and Maintenance

Access

Steep terrain and limited existing track accesses have been identified within the north and north east of the Study Area however some existing forestry tracks are present within this area. Existing highway infrastructure predominantly within the east and west of the Study Area also provides suitable accesses for corresponding Route Options. Due to the presence of wind farms within the Study Area, particularly within the centre and north east of the Study Area, existing access tracks are present and some tracks will likely be upgraded to accommodate new windfarms within the Study Area.

Angle Towers

Angle towers will be assessed during the alignment stage, therefore, will not be assessed any further in this report.

5.3.5 Proximity

Clearance Distance

Clearance will be assessed during the alignment stage, therefore, will not be assessed any further in this report.

Wind Farms

As noted in **Section 5.1.4** and **5.1.6**, there are several existing and consented wind farms within the Study Area. Notably, Tangy IV Wind Farm which is inherent to the Proposed Development, Beinn an Tuirc, Blary Hill Wind Farm, Cnoc donn and the proposed Cnoc Buidhe Wind Farm and Arnicle Wind Farm. A clear understanding of the proposed Cnoc Buidhe Wind Farm connection requirement which borders Tangy IV Wind Farm needs to be understood and evaluated in conjunction with Tangy development to avoid OHL routeing restrictions particularly in relation to Route Option A2.

Communication Masts

The OS map and cell mapper website[24] have been assessed to check if any communication masts are present within the Study Area, of which communication masts were found to be located within the east of the Study Area. Once structure types and heights are confirmed at the alignment stage, a more accurate check of communication mast constraints would be undertaken.

Urban Environments

As identified within **Section 5.1.3**, the Study Area is largely rural and is not densely populated. Although there are sporadic farms and individual dwellings, these are located mostly within the east of the Study Area following the B842.

5.4 Economic Constraints

5.4.1 Regulated Company

SSEN Transmission owns and maintains the electricity transmission network across the north of Scotland and holds a license under the Electricity Act 1989 to 'develop and maintain an efficient, co-ordinated and economical electricity transmission system in its licensed area'. SSEN Transmission are regulated by Ofgem, who determine how much revenue SSEN Transmission can earn from customers to cover the cost of maintaining and reinforcing the electricity network.

Ultimately the costs associated with development, operation and maintenance of the Transmission systems form part of the energy user's bill. Further information on how SSEN transmission are Regulated be found here: https://www.ssen-transmission.co.uk/information-centre/industry-and-regulation/

5.4.2 Maintenance of Supply

SSEN Transmission are required to maintain a reliable network. It is highlighted that Route Options which require crossing of the existing line will incur increased costs and risk elements associated with the required temporary OHL diversions which would be needed to maintain a Transmission connection (132 kV) to Tangy during the construction phase.

5.4.3 Assumptions and Limitations

Due to the early stage of the project limited information was available to make a cost comparison appraisal, resulting in the requirement to make very high-level assumptions for each of the cost comparison elements considered. More detailed cost estimates of the investment required to build the replacement OHL will be derived as the project progresses.

[24] Cell Mapper (N/A). Cellular Tower and Signal Map. [online]. Available at: https://www.cellmapper.net/ (Accessed 15 June 2022).

6. COMPARATIVE APPRAISAL

This section provides a summary of the environmental, engineering and economic characteristics relevant to each Route Option and an appraisal of the performance of each Route Option with reference to each characteristic. Only those factors which inform the comparative appraisal are assessed.

Routes A, B and C are considered together to allow a clear comparison between the Route Options in each zone. Route Options D and E are then considered together.

6.1 Routes A, B and C

6.1.1 Environmental Appraisal

Natural Heritage

Designations

There are no statutory designated sites located within Route Options with the exception of Route Option A1 which intersects the Bellochantuy and Tangy Gorges SSSIs, this geological feature could be affected by the works. Route Option A2 does not cross any SSSIs, however it is worth noting that Route Option A2 is within 500 m to the designated Kintyre Goose Roosts SPA and Ramsar and Kintyre Goose Lochs SSSI compared to Route Option A1 which is 1.9 km west of these sites at its closest point. Route Option A2 also has Greenland white-fronted goose roosts nearby which could be affected by works. Foraging Greenland white-fronted goose have been recorded within Route Option A1, therefore Route Option A1 could potentially interrupt flight paths. Route Option A1 crosses over several areas of Ancient Woodland recorded on the Ancient Woodland Inventory (AWI) Scotland, there is no Ancient Woodland recorded within Route Option A2. Therefore, Route Option A1 has been given a **Red** RAG rating Route Option A2 has been given an **Amber** RAG rating.

Route Option B1 includes several areas of Ancient Woodland according to the AWI and so has been assigned a **Red** RAG rating. Route Option B2 has an area of regenerating Ancient Woodland and so has been assigned a **Red** RAG rating.

Route Options C1 and C2 have areas of Ancient Woodland according to the AWI and Route Option C2 also has a Local Nature Conservation Area (LNCS) within it, therefore both Route Options have been given a **Red** RAG rating.

Therefore, in relation to designations, within Zone A Route Option A2 would be preferrable. Zone B Options all have areas of Ancient Woodland and therefore not distinguishable in preference to another. Zone C Options both have Ancient Woodland however, Route Option C2 also has a LNCS and so Route Option C1 would be the Preferred Option.

Protected Species

Zones A, B and C all have areas within woodland and therefore have the potential to host bats, badgers, red squirrels and pine marten. All three zones also have watercourses running through them and so have the potential to host species such as otter and water vole along with reptiles including adders. Therefore, all three zones have been given an **Amber** RAG rating.

For Zone A no preference is given to the Route Options as both have the potential for protected species. For Zone B, Route Option B2 is preferred as it crosses fewer potentially important woodlands and fewer watercourses compared to Route Option B1, meaning it will be less likely to be constrained by woodland and riparian dwelling species. For Zone C, Route Option C2 has a diverse range of habitats which could support various kinds of species from woodland dwellers to moorland wildlife. Route Option C1 does contain high volumes of woodland which would support woodland dwelling

species such as bats, badgers, red squirrels and pine martens but it does not have the same heath and bog constraints compared to Route Option C2. Therefore, C1 is the preferred Route Option.

Habitats

All Zones have been assigned a **Red** RAG rating as all Route Options directly pass through potential Annex 1 habitats (namely heath and blanket bog). There is also potential for GWDTEs.

Of the available options, Route Option A2 would be preferred in Zone A as it passes through mainly conifer plantation and only small areas of moorland. For Zone B and C, B1 and C1 would be preferrable as they are either the shortest Route Option, or cross the smallest area of heath and blanket bog or both.

Irreplaceable Habitat

Irreplaceable habitat was calculated for each Route Option and node using Habitat Map of Scotland dataset[25] and the AWI[26] and consists of Ancient Woodland and / or blanket bog assumed to be of moderate condition.

Route Option A1 has been assigned an **Amber** RAG rating as it contains irreplaceable Ancient Woodland (of semi natural origin). All Ancient Woodland (with the exception of the AWI classified as Long Established of Plantation Origin) is classified as irreplaceable habitat. The irreplaceable habitat covers 0.78% of Route Option A1 and is located in one section that could be avoided at alignment stage in order to achieve No Net Loss (NNL) or Net Gain (NG). Route Option A2 has been assigned a **Green** RAG rating as it contains no irreplaceable habitat and therefore NNL or NG could be achieved irrespective of the final alignment.

All Zone B and C Route Options have been assigned a **Red** RAG rating as each contain Ancient Woodland and / or blanket bog. All Route Options within Zones B and C contain continuous sections of irreplaceable blanket bog habitat which spans the full width of the Route Options in addition to smaller patches of Ancient Woodland, with the exception of Route Option B2 which contains no Ancient Woodland. Consequently, irreplaceable habitat is likely unavoidable for these Route Options. If blanket bog is in 'moderate' or 'good' condition this would constitute irreplaceable habitat as assumed within the BNG assessment. It is possible that there will be areas of blanket bog that could be in 'poor' condition, within which an alignment could be developed and therefore, the presence of blanket bog does not necessarily preclude a Route Option from achieving BNG at this stage.

Non-irreplaceable habitat

The Route Options within Zones A, B and C have been ranked in relation to the extent and distribution of irreplaceable habitat and the estimated biodiversity value (in terms of BUs) to identify the most favourable option within each the Zone with respect to BNG (with ranking 1 being the most favourable Route Option in terms of the lowest predicted loss in biodiversity value). The options with the greatest extent of irreplaceable habitat and highest BU value (excluding the irreplaceable habitats) are shown in red, that with the lowest value is shown in green.

As shown in **Table 6-1,** the Route Options within each Zone which contain the lowest BU values are A2, B1 and C1.

[25] NatureScot (N/A). Habitat Map of Scotland dataset. [online]. Available at: https://www.nature.scot/landscapes-and-habitats/habitat-map-scotland (Accessed 24 March 2022).

[26] NatureScot (2020). Ancient Woodland Inventory. Available: https://gateway.snh.gov.uk/natural-spaces/dataset.jsp?dsid=AWI

Table 6-1: Summary of total BU, area and percentage of irreplaceable habitat and overall ranking for Route Options between Zones A to C.

Zone	Option	Irreplaceable Habitat Area (ha)	Irreplaceable Habitat (% of Site)	Biodiversity Units (BU)	Ranking
Zone A	Route Option A1	8.22	0.78	6854.17	2
	Route Option A2	0.00	0.00	3487.43	1
Zone B	Route Option B1	129.65	40.46	1958.74	1
	Route Option B2	127.21	41.47	2370.06	2
Zone C	Route Option C1	102.25	16.60	2665.95	1
	Route Option C2	159.62	44.93	1387.43	2

For Zone A, Route Option A1 has the largest BU (6854.17) compared to Route Option A2 (3487.43). Route Option A1 is predominantly low distinctiveness conifer woodland and modified grassland with a large BU provided by high distinctiveness habitats such as upland heath, upland acid and other neutral grassland in addition to smaller areas of high distinctiveness woodlands and wetlands. Route Option A2 also consists mostly of low distinctiveness conifer woodland with the remaining habitats mostly of high distinctiveness upland heath and grassland.

For Zone B, Route Option B2 has the largest BU (2370.06) compared to Route Option B1 (1958.73). Route Option B1 is predominantly high distinctiveness purple moor grass and rush pasture and other neutral grassland in addition to several smaller sections of high distinctiveness grassland and low distinctiveness conifer and modified grassland. Route Option B2 consists entirely of high distinctiveness upland heathland and other neutral grassland.

For Zone C, Route Option C1 has a higher BU (2665.95) compared to Route Option C2 (1387.43). Both Route Options consist of similar habitats and are predominantly low distinctiveness conifer woodland and high distinctiveness upland heath in addition to smaller areas of grassland, woodlands and scrub of variable distinctiveness.

The extent of irreplaceable habitat and the associated BU for each of the node sections (see **Plate 4.2**) are presented in **Table 6-2** below. Node 2A and 2B are comprised of 100% irreplaceable habitat and consequently no BU values have been calculated.

Table 6-2: Summary of total BU, area and percentage of irreplaceable habitat for each node section.

Node	Irreplaceable Habitat Area (ha)	Irreplaceable Habitat (% of Node)	Biodiversity Units (BU)
Node 1A	0.9 (all Ancient Woodland)	0.73	1251.19
Node 1B	0.00	0.00	227.26
Node 1C	0.00	0.00	821.42
Node 2A	56.92 (all blanket bog)	100.00	N/A as section contains 100% irreplaceable habitat
Node 2B	47.83 (all blanket bog)	100.00	N/A as section contains 100% irreplaceable habitat
Node 2C	47.49 (all blanket bog)	46.62	505.76

In summary:

- For Zone A, Route Option A2 is the Preferred Option as it contains no irreplaceable habitat and has a lower biodiversity value (3487.43 BU) compared to Route Option A1 (6854.17 BU).
- For Zone B, Route Option B1 is the Preferred Option although irreplaceable habitat spans the entire width of both Route Options. Route Option B1 contains slightly more irreplaceable habitat although the differential between the options is minimal, however B1 has a lower biodiversity value between the two options.
- For Zone C, Route Option C1 is the Preferred Option as although it has a higher BU, it contains significantly less irreplaceable habitat.

The preferred combination of Route Options from the Zones and associated nodes, from a BNG perspective is Route Option A2, B1 and C1 which would require node sections 1A, 1B, 1C and 2A. This combination has a total of 289.72 ha of irreplaceable habitat which is likely to be unavoidable and has a total BU value of 10,411.99.

Ornithology

All Zones have been assigned an **Amber** RAG rating as all options pass-through areas of woodland edge habitat, and moorland that could support Schedule 1 (Golden eagle, harriers, divers, whooper swan *Cygnus cygnus*) and red listed BoCC species (such as, curlew, black grouse, common scoter *Melanitta nigra*, hen harrier, and merlin *Falco columbarius*). Route Option A2 is less than 500 m from the Kintyre Goose Roosts multiple designated site that is designated for Greenland white-fronted geese, that has a roosting population. However, they are known to forage in areas immediately north of Route Option A1. Route Option A1-B1-C1 would be preferred due to the lower woodland level, along with less moorland habitat.

Hydrology, Geology and Hydrogeology

All Zones have been assigned an **Amber** RAG rating, as each of the Route Options have the potential to compromise quality or quantity of surface waters or groundwaters, in relation to public or private water supplies, or GWDTE. However, subsequent surveys will establish specific receptors considered to be at risk.

Notwithstanding, due to the nature of the Proposed Development, refinement of alignment, assumed construction good practice and compliance with relevant guidance, it is likely that risks associated with each of the Route Options will be minimised.

Conclusion

Route Option A2 is the Preferred Option over Route Option A1 when considering designations, habitats and BNG due to the absence of designations and irreplaceable habitats within this Route Option. Due to the presence of woodland and watercourses throughout the Route Options with the potential to support protected species, no preference is noted for protected species. Ornithology favours Route Option A1 due to the lower woodland level and less moorland habitat present within this Route Option however, it is noted that Route Option A1 also has the potential to disrupt flight paths for Greenland white-fronted goose. There is no distinguishable factor between the Route Options when considering hydrology, geology and hydrogeology. As such, Route Option A2 is the Preferred Route for Zone A.

Route Option B1 is the Preferred Option over Route Option B2 when considering habitats, BNG and ornithology due to the lower biodiversity value in terms of presence of woodland and moorland habitat, and shorter route length, meaning effects can be minimised. It is noted that Ancient Woodland and irreplaceable habitat spans the width of both Route Options with Route Option B2 being marginally favourable for protected species due to its potential to cross fewer potentially important woodlands and watercourses compared to Route Option B1. However, Route Option B2 contains an area of regenerating Ancient Woodland resulting in a marginal preference for Route

Option B1 for designations. There is no distinguishable factor between the Route Options when considering hydrology, geology and hydrogeology. Overall, Route Option B1 is the Preferred Route for Zone B.

Route Option C1 is the Preferred Route over Route Option C2 when considering designations, habitats, protected species, BNG and ornithology due to the absence of designated sites and lesser presence of irreplaceable habitats within Route Option C1 in comparison to Route Option C2. There is no distinguishable factor between the Route Options when considering hydrology, geology and hydrogeology.

Overall, considering natural heritage designations, protected species, habitats, BNG, ornithology and hydrology, geology and hydrogeology a combination of Route Options A2, B1 and C1 are preferred, although Route Options B2 and C2 are only marginally less preferred.

Cultural Heritage

The Zones have been assessed to identify key constraints for each Route Option. The assessment has taken account of the opportunities for mitigation, such as avoidance through design and the adoption of other standard working practices which, if implemented, could overcome the identified constraint.

Designations

No Zones have the potential for direct impacts on any World Heritage Sites, Inventory GDLs or Inventory Battlefields.

Route Options A2, B1, B2, C1 and C2 do not have any Scheduled Monuments within them. However, Route Option A1 has four Scheduled Monuments within it:

- Corputechan, hut circles E of, Kintyre (SM7434);
- Cleongart, dun (SM3178);
- An Dunan, dun (SM3111); and
- Blary, dun (SM3077).

There is also cluster of Scheduled Monuments to the west of Route Option A1, focused along the coastline where there is the potential for indirect or setting impacts on these assets. There is an additional Scheduled Monument, Garvalt, dun (SM3740) circa 95 m to the north of Route Option A1 and B1 and Carragh an Talaidh, chambered cairn (SM189) circa 800 m to the north of Route Option C1 where there is potential for indirect or setting impacts on these assets.

Route Option B2 has no undesignated assets within it. Route Option A1 has 31 undesignated assets, Route Option B1 has seven undesignated assets, Route Options A2 and C2 both have six undesignated assets and Route Option C1 has four undesignated assets within it.

As such, due to the presence of and proximity of assets within the Zone and along the coastal areas, Route Option A1 has been allocated a **Red** RAG rating for designations. Route Options B1 and C1 have been allocated an **Amber** RAG rating for designations due to the proximity of Garvalt, dun (SM3740) and Carragh an Talaidh, chambered cairn (SM189) to the north of the routes. Route Options A2, B2 and C2 have been allocated a **Green** RAG rating for designations as there are no designations within or in close proximity to the route option.

Cultural Heritage Assets

No Zones have the potential for direct impacts on any Listed Buildings, non-inventory GDLs or Conservation Areas. There are a number of Listed Buildings in the proximity of the Zones A and C including a cluster of Listed Buildings to the west of Route Option A1, focused along the coastline. There is the potential for indirect or setting impacts on these assets. There are also a number of Listed Buildings in proximity to the east of Route Option C2, again there is potential for indirect impacts on these assets.

As such, due to the proximity of a number of Listed Buildings to Route Options A1 and C2, these Route Options have been allocated an **Amber** RAG rating for Cultural Heritage Assets. As there are no cultural heritage assets within close proximity to Route Options A2, B1, B2 and C1, these Route Options have been allocated a **Green** RAG Rating for Cultural Heritage Assets.

Conclusion

In conclusion, taking into consideration the direct and indirect impacts on both Designations and Cultural Heritage Assets, Route Options A2, B2 and C2 are preferred from a Cultural Heritage perspective.

People

Proximity to Dwellings

There are numerous dwellings scattered across the Route Options, with the exception of Route Options A2 and B2 that contain no dwellings. Particular pinch points are located along the eastern boundary of the Study Area associated with Zone C, notably for the areas south of the existing Carradale GSP, around Bridgend and west of Carradale provide a pinch point for the alignment for Route Option C2 and adjacent north and east of Carradale GSP for Route Option C1. There are no particular pinch points within Route Options A1 and B1, as there are less than 10 dwellings across each of these Route Options. There will be opportunities to avoid encroaching within close proximity to these dwellings during the alignment stage.

It is considered that there are some opportunities to minimise potential effects on dwellings for Route Options A1, B1, A2 and B2 whereas Route Options C1 and C2 offers greater constraints. Route options A1, A2, B1 and B2 have been allocated a RAG rating of **Green** whilst Route Options C1 and C2 have been allocated a RAG rating of **Amber** due to the likely proximity of dwellings within this Route Option. Route Option C2 offers the most constraints in terms of proximity to dwellings and pinch points for alignment options to the south of Carradale GSP.

Conclusion

Overall, as Route Options A2 and B2 contain no dwellings, these are the preferred Route Options within these Zones, however it is noted that all Route Options within Zone A and B contain less than 10 dwellings and therefore opportunities to avoid encroaching within close proximity to these are likely achievable during the route alignment stage. Due to the constraints within Route Option C2, Route Option C1 is the preferred route within this Zone. As such, the preferred route from a proximity to dwellings perspective is Route Option A2, B2 and C1.

Landscape and Visual

Designations

As identified in **Section 4.6.1** above, there are no National Designations within the Study Area, although there are some which would have intervisibility with the Study Area. These are discussed below.

The North Arran WLA and North Arran NSA would be over 8 km from the Study Area and as such a wood pole line or alternatively steel lattice towers are not likely to be perceptible from any of these designations, particularly where backdropped by landform and forestry. As such, none of the Route Options would affect the North Arran NSA and WLA.

As identified in **Section 4.6.1** above, there are two APQs within the Study Area; East Kintyre (Coast) and West Kintyre (Coast). Route Option A1 is the nearest and only Route Option that would have potential to be perceptible from the West Kintyre (Coast) APQ. The nature of the landform along the coast is likely to screen any visibility of the Route Option, limiting to glimpsed views above and between local landform formations immediately to the east of the A83 between Tangy IV Wind Farm

substation and Glenbarr. It is therefore unlikely to create any significant effects on the special qualities of the APQ.

Although Route Option C2 does not fall within the East Kintyre (Coast) APQ, it is the closest and will be perceptible from its north western border, at Carradale. Here, glimpsed views of the Route Option will be available above and between the local landform formations immediately intervening vegetation and built form, as it heads west up the steep slopes of Cnoc Breac to the east of Carradale.

Route Option A2 is the Preferred Option over Route Option A1 on landscape designations due to its location further away from the West Kintyre APQ, with no potential intervisibility. Route Option A2 has been given a **Green** RAG rating. Route Option A1 has also been given a **Green** RAG rating as whilst it may be perceptible it would be from only a relatively small proportion of the overall APQ and would not affect its special qualities.

There is no preference between Route Options B1 or B2 as they both lie distant from the regional designations with no potential to affect the special qualities. A **Green** RAG rating has been given to both.

Route Option C1 is the Preferred Option over Route Option C2 due to surrounding forestry potentially acting as screening and backdrop in views from the East Kintyre (Coast) APQ. Route Option C1 has been given a **Green** RAG rating. Route Option C2 has also been given a **Green** RAG rating as, although it may be perceptible from the East Kintyre (Coast) APQ, it will be viewed in the context of existing OHL infrastructure and will only be perceptible from a relatively small proportion of the designation.

Landscape Character

The majority of Route Option A1 and the entirety of Route Option A2 falls within LCT 39: Plateau Moor and Forest – Argyll. This LCT is a relatively remote, large-scale landscape which extends across the central spine of the Kintyre Peninsular. This LCT also includes existing OHL infrastructure and several wind farms.

Four small areas of the far western extents of Route Option A1 fall within LCT 53: Rocky Coastland – Argyll. This LCT is relatively well settled and forms relatively narrow linear margins along the east and west Kintyre coast. This LCT also includes existing OHL infrastructure, generally located along the main two roads; the A83 and B842.

Although some areas of Route Option A1 pass through less sensitive areas of forestry e.g. from Tangy IV Wind Farm Substation to Drumore, most of Route Option A1 passes through the more sensitive, open moorland areas, alongside forestry plantation on the lower western slopes of the Plateau Moor and Forest. This Route Option does not encounter any steep slopes but does include areas of Ancient and Native Woodland.

Route Option A2 is the more direct route, passing through less sensitive areas of forestry with two short northern sections passing through shallow valleys in open moorland, along the forestry edge and immediately to the west of the operational Beinn an Tuirc Wind Farm. This Route Option encounters some small areas of steep slopes, although the Route Option includes the potential to develop alignments to avoid these.

Route Option A1's position along the more exposed areas of landscape at the edge of forestry and open valley would have potential to be more intrusive in the relative remoteness of this LCT over Route Option A2. Therefore, Route Option A1 has been given a RAG rating of **Amber.** Route Option A2 is the Preferred Route over Route Option A1 for least effects on landscape character and is given a RAG rating of **Green**. This is due to its potential to develop alignments that pass through a limited area of sensitive landscape and is largely located within forestry, which provides some screening and combined with its proximity to existing wind turbines and associated infrastructure, lessens the sensitivity to the type of development proposed.

The entirety of Route Option B1 and B2 fall within LCT 39: Plateau Moor and Forest – Argyll. Both Route Options pass through the more sensitive area of open moorland, although Route Option B1 is located on lower ground and in a shallow valley. Both Route Options, although to a slighter greater extent, Route Option B1, encounter some areas of steep slopes and areas of Ancient and Native Woodland. Both Route Options include the potential to develop alignments to avoid these slopes and woodland, but these areas within Route Option B1 are fairly narrow.

Both Route Options B1 and B2 pass through areas of open moorland, however Route Option B1 has potential to be sited on lower ground than Route Option B2, but it would potentially be more intrusive in the Barr Water Valley than Route Option B2. Route Option B2 has potential to be aligned around and between areas of higher landform, albeit still a relatively exposed part of the landscape. Therefore, both Route Options have been given an **Amber** RAG rating, with a marginal preference to Route Option B2 due to its location away from Barr Water Valley.

The majority of Route Option C1 and C2 fall within LCT 39: Plateau Moor and Forest – Argyll, with their far eastern ends passing through LCT 36: Coastal Glens. LCT 36 is found along the east coast of Kintyre, wedged between the large-scale landscape of LCT 39.

Approximately half (central area) of Route Option C1 passes through the less sensitive areas of forestry, with its western section passing through the more sensitive elevated open moorland of LCT 39. A small eastern section also passes through the sensitive low-lying pastures of LCT 36, along the floor of the Carradale Water Valley.

In contrast, almost the entirety of Route Option C2 passes through the sensitive open moorland of LCT 39 with the exception of a small eastern section which passes through the less sensitive area of forestry along the northern slopes of Cnoc Breac. A small eastern section also passes through the sensitive low-lying pastures of LCT 36, along the floor of the Carradale Water Valley.

The eastern part of both of these Route Options encounters some large areas of steep slopes, Ancient and Native Woodland. Although Route Option C1 includes the potential to develop alignments to avoid the majority of these, these areas are very limited and narrow. Route Option C2 does not have the option to avoid these sensitive areas due to passing along the steep northern slopes of Cnoc Breac which are also designated as Ancient Woodland.

Route Option C2 passes through the largest area of open moorland, when compared to Route Option C1 and as such, would be potentially more intrusive in the relative remoteness of this LCT. Route Option C2 includes several areas of steep slopes, Ancient and Native Woodland, with limited availability to avoid these areas. There are however existing OHL and undergrounded cable routes through this area, which provide opportunities to follow reducing additional impacts on the landscape. Route Option C1 encounters steep slopes to the east but has potential to avoid them, however the easternmost section of this Route Option would run along the Carradale Water Valley, affecting several characteristics of the LCT, such as narrow glens with a domestic scale enclosed by forested ridges, and could lead to cumulative effects due to its proximity to an existing OHL along this valley Route Option C1 would also extend the presence of energy infrastructure further north from the existing wind farms and OHLs.

Both Route Options have therefore been given a RAG rating of **Red**.

Visual

Potential visual effects from the west of Route Option A1 would be limited to users of the A83, local residents along the A83 and people visiting the area for recreational and tourist purposes. In these areas Route Option A1 would be screened by forestry from Tangy IV Wind Farm Substation to Dunmore. There would be slightly higher potential of visual effects from Dunmore to Glenbarr as there would be glimpsed views above and between local landform formations immediately to the east of the A83. The eastern end of Route Option A1 would run along the southern slopes of the Barr

Water Valley, where it would be potentially visible at the open edge of the forestry line for local residents and visitors.

Potential visual effects of Route Option A2 would be limited in all directions due to its remote location and position on the elevated plateau. Surrounding forestry screens the majority of views of this Route Option from sensitive visual receptors such as users of The Kintyre Way and users / visitors to the Lussa Loch to its south east, although there may be some glimpsed views available from the Kintyre Way, north along the Trathduie Water Valley as it passes along the far northern edge of Lussa Loch. These views will be heavily screened and would be limited to where the proposed Route Option crosses the Trathduie Water, the Route Option includes the potential to develop alignments to avoid these limited views.

Route Option A2 is the Preferred Option on visual receptors over Route Option A1 due to its further distance from visual receptors and limited visibility. Route Option A2 is given a RAG rating **Green**. Route Option A1 is given a RAG rating of **Amber** due to its potential to be visible from the A83 and residents along the Barr Water Valley.

Route Option B1 would continue from Route Option A1 along the Barr Water Valley, but in a more remote part where there are no roads or properties, and walkers are likely the only visual receptor. It would be seen from further west along the valley, but would have limited wider visual effects. Route Option B2 would be on slightly more elevated land and has potential to be visible to walkers within the wider area, but in the context of the existing wind farms and OHLs, is unlikely to be particularly perceptible.

Route Option B1 and B2 would have limited potential for significant visual effects, largely due to distance from any receptors except walkers. Both are given a **Green** RAG rating. Route Option B1 is in closer proximity to walkers and residents along Barr Water Valley, and Route Option B2's higher elevation with potentially more visibility to walkers within a wider area do not create a clear preference.

Potential visual effects from Route Option C1 would be largely at its eastern extents, including residents along the B842 and on the Carradale Water valley floor, users of the B842, walkers, cyclists, and other isolated properties in this area. Route Option C1 has potential to be particularly prominent in views from the road and valley floor due to the limitations of aligning around the steep topography, and openness along the Carradale Water. Route Option C1 would also be viewed in the context of existing OHL infrastructure along the B842 corridor.

Potential visual effects from Route Option C2 are limited to users of the B842, local residential along the B842 and within Carradale, people involved in other outdoor pursuits, such as cyclists using the NCR 78 and The Kintyre Way and people visiting the area for recreational and tourist purposes. The Route Option will also be viewed in the context of existing OHL infrastructure and existing and proposed wind farms.

Views of Route Option C2 would predominantly be limited to the far eastern end of the route as it heads down the northern slopes of Cnoc Breac to the west of Carradale. There would be a higher potential of visual effects from residential properties along the B842 with open views of the route as it passes through Carradale Water Valley and from the western parts of Carradale. Views from users of the B842 and NCR 78 would be limited to short stretches of road with open views towards the route. At Carradale, glimpsed views of the Route Option will be available above and between the local landform formations, immediately intervening vegetation and built form, as it heads east down the steep slopes of Cnoc Breac. It should be noted that Route Option C2 would be viewed in the context of existing OHL infrastructure along the B842 corridor.

Route Option C1 and C2 both have potential to cause effects on visual receptors such as; users of the B842, local residential along the B842 and within Carradale and people involved in other outdoor

pursuits, such as cyclists using the NCR 78 and The Kintyre Way. On its eastern section, Route Option C1 would run parallel to the B842 and in close proximity to the above listed receptors, for which this option could be visually very intrusive, particularly to the residential receptors at Lag Kirkmichael because of the steep topography limiting alignment options in close proximity. It also would extend energy infrastructure in views further north than currently exists. To the west, both options go up steep slopes which could lead to potential visual effects for sensitive receptors in the Carradale Valley, especially Route Option C2 as it reaches the higher open moorland of Cnoc Breac. Both options would be seen in the context of existing energy infrastructure and the B842, and cumulative effects would be a consideration too. Route Option C1 and Route Option C2 are both given an **Amber** RAG rating.

Conclusions

Overall, considering landscape designations, character and visual amenity for Zone A, B and C a combination of Route Options A2, B2, and C1 are preferred, although Route Options B1 and C2 are only marginally less preferred.

Land Use

Agriculture

The majority of the agricultural land within the Route Options for Zones A, B and C is Class 6.3 which is land capable of use as rough grazing and Class 5.3 which is land use as improved grassland. There are several sections of the Route Options within areas identified as Class 4.2, land capable of producing a narrow range of crops, associated with Barr Glen, Carradale Water and Bhainn a Chanocain, and areas identified as Class 6.1 located within the eastern extents of Route Options C1 and C2. However, as the majority of the land is not a particularly sensitive or fertile category any impacts on agriculture as a result of the route options is considered to be low, therefore a RAG rating of **Green** has been allocated for all Route Options.

Forestry

As per the SSEN Route Option appraisal guidance criteria, this Forestry Section of the Report only considers and appraises the commercial conifer element of the Route Options A1, A2, B1, B2, C1 and C2.

Route Option A1 is host to approximately 495 ha of commercial conifer woodland. Specific locations of the Route have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would also be the opportunity during the OHL Alignment Selection Stage to avoid specific areas of commercial conifer woodland. Route Option A1 has been allocated a RAG rating of **Amber**.

Route Option A2 is host to approximately 759 ha of commercial conifer woodland. Specific locations of the Route have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would be minimal opportunity during the OHL Alignment Selection Stage to avoid specific areas of commercial conifer woodland and therefore it is assumed that the commercial and/or financial viability of the forestry operations within this Route Option could be compromised as a result. Route Option A2 has therefore been allocated a RAG rating of **Red**.

Route Option B1 is host to approximately 35 ha of commercial conifer woodland. There would be the opportunity during the OHL Alignment Selection Stage to avoid areas of commercial conifer woodland. Route Option B1 has been allocated a RAG rating of **Green**.

Route Option B2 is host to approximately 20 ha of commercial conifer woodland. There would be the opportunity during the OHL Alignment Selection Stage to avoid areas of commercial conifer woodland. Route Option B2 has been allocated a RAG rating of **Green**.

Route Option C1 is host to approximately 300 ha of commercial conifer woodland. Specific locations of the Route have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would be minimal opportunity during the OHL Alignment Selection Stage to avoid specific areas of commercial conifer woodland. Route Option C1 has been allocated a RAG rating of **Amber**.

Route Option C2 is host to approximately 82 ha of commercial conifer woodland. Specific locations of the Route have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would also be the opportunity during the OHL Alignment Selection Stage to avoid specific areas of commercial conifer woodland. Route Option C2 has been allocated a RAG rating of **Amber**.

Recreation

There are no core paths or recreational points of interest within Route Option A1 and A2. Route Option A2 is approximately 830 m north west of the Kintyre Way compared to Route Option A1 which is approximately 1.9 km north west of this. Given the distance, and intervening vegetation such views would be heavily screened therefore a reduction in visual amenity would be minimal. Both Route Options have been allocated a RAG rating of **Green**.

There are no core paths within either Route Option B1 or B2. However, the Barrglen Equitation Centre is located at the western extent of Route Option B1 in Arnicle which provides riding lessons and riding holidays. Due to the location of this facility in relation to Route Option B1, it is considered that there is potential to develop alignments to avoid this facility, therefore a RAG rating of **Green** has been allocated. Within Route Option B2 there were no recreational points of interest, therefore a RAG rating of **Green** has been allocated.

Route Option C1 will run parallel to Core Path C088 (b and d) and NCR 78 between Lag Kilmichael and Carradale GSP which may reduce visual amenity for walkers, hikers and cyclists. Therefore, a RAG rating of **Amber** has been allocated. Similarly for Route Option C2, the route will come in close proximity to Core Path C088 (b and c), the Kintyre Way and NCR 78 where it would join into Carradale GSP which may reduce visual amenity for walkers, hikers and cyclists. Therefore, a RAG rating of **Amber** has been allocated.

Conclusion

Overall, there is no distinguishable factor between the Route Options within each zone when considering agriculture. In terms of recreational use, there is no distinguishable factor between the Route Options within Zone A or B as all Route Options have been allocated a **Green** RAG rating. Due to the presence of the Barrglen Equitation Centre within Route Option B1, Route Option B2 could be considered preferred however this would only be marginally preferred as there are opportunities to avoid this facility during the Alignment Selection Stage. Route Option C2 is the Preferred Option over Route Option C1 as Route Option C1 is in close proximity to the core paths over a larger distance in comparison, with the potential to reduce visual amenity for walkers, hikers and cyclists. From a forestry perspective, Route Options A1, B2 and C2 are the preferred Route Options as these routes hold the least amount of commercial conifer woodland and there would be opportunities to avoid this during OHL alignment stage.

Planning

Policy

Adherence to National, Regional and Local planning policy will in part largely depend on avoiding or minimising potential constraints noted, particularly in relation to potential impacts on the natural environment given presence of designated sites and areas of landscape importance.

Route Option A1 is considered to have the highest risk of adverse effects due to the potential for impacts on Scheduled Monuments and its route through areas of Ancient Woodland. The differences between the remaining Route Options are relatively small, such that no one Route Option or combination of Route Options stand out as substantially better able to accommodate an OHL alignment. As such, all Route Options within Zones A, B and C have been allocated an **Amber** RAG rating. However, on balance it is considered that Route Option A2, B2 and C2 are the preferred combination, as it limits impacts to designations including Scheduled Monuments and visual impacts when compared to Route Options A1, B1 and C1.

At the current stage, the site boundaries associated with planning applications 14/01978/PP, 18/00034/FDP, ECU00003231 and the proposed Cnoc Buidhe Wind Farm overlap with both Route Options A1 and A2. An **Amber** RAG rating has therefore been allocated to these Route Options. Planning applications 14/01978/PP and ECU00003231 also intersect Route Option B2, therefore an **Amber** RAG rating has been allocated. For the remainder of the Route Options, it is thought that planning applications can be avoided through route alignment development and therefore a **Green** RAG Rating has been allocated.

6.1.2 Engineering Appraisal

Infrastructure Crossings

Major Crossings and Metallic Pipes

With the exception of Route Option C1 all Route Options have a **Green** RAG rating (no major infrastructure crossings present). Route Option C1 is bisected by the Crossaig to Carradale 132 kV OHL and there are a number of circuits feeding into Carradale GSP. Route Option C2 geographically avoids the circuit congestion in this area by teeing into Crossaig to Carradale 132 kV OHL from the west avoiding the need to cross the existing circuit. A specific design solution would not be considered appropriate at this stage but there is a risk that any future OHL alignment would be undergrounded due to technical constraints. One potential mitigation of this circuit interface risk would be to consider locating the T-point connection further north on the Crossaig to Carradale 132 kV OHL circuit. Route Option C1 has therefore been allocated an **Amber** RAG rating.

Road Crossings

Where Route Options have one crossing or less, they have been classified with a **Green** RAG rating. Where Route Options have two crossings or less they have been classified with an **Amber** RAG rating. Where Route Options have three or more crossings they have been classified as a **Red** RAG rating.

Route Options B2 has been allocated a **Green** RAG rating in terms of risk of road crossings as there is approximately one crossing within Route Option B2. Route Option B1 has been allocated an **Amber** RAG Rating in terms of constraint risk of road crossings as there are two road crossings. Route Options A1, A2, C1 and C2 have all been allocated a **Red** RAG rating in terms of constraint risk of road crossings as there are 13 road crossings within Route Option A1, nine road crossings within Route Option A2, three crossings within Route Option C1 and eight crossings within Route Option C2. These crossings are a mix of access tracks and local roads, although Route Option C1 is bisected by the B842 in the eastern section of the Route Option.

Environmental Design

Elevation

Rudimentary elevation scoring in terms of potential for the route to be constrained in each of the Route Options could be misleading. The Route Options are circa 1 km wide and can include within that extent an area of high elevation that may not be practical for the OHL to be routed over or near. However, there could be sufficient route remaining to enable detailed routeing (avoiding the areas of

potential constraint). RAG key scoring indicates a percentage of elevation capture of a whole Route Option at maximum height of 200 m AOD. We would therefore refer to the individual Route Option centre profiles to state that all Route Options at this stage wouldn't exceed 350m AOD and could be routed to a lower altitude if necessary, during alignment development stage.

The majority of the length of Route Option A1 runs along the coastline and as such only 5% of the Route Option is above 200 m AOD. Route Option A1 has been allocated a **Green** RAG rating. The remaining Route Options within Zones A, B and C have been allocated a **Red** RAG rating as over 40% of all the Route Options are above 200 m AOD, with 99.8% of Route Option B2 being above 200 m AOD. Route Option B1 performs more favourably than B2 in terms of elevation, with more flexibility within the route for alignment opportunities below 200 m AOD.

Route Options C1 and C2 are largely comparable in terms of routeing opportunities. Although all these Route Options have been allocated a **Red** RAG rating, there still remains at least 40% of the Route Options below 200 m AOD, which presents more flexibility for detailed routeing.

Atmospheric Pollution

No Route Options are located in areas of high pollution and therefore they have all been allocated a **Green** RAG rating.

Contaminated Land

No known areas of contaminated land or evidence of a risk of contaminated land was identified within the Route Options and therefore they have all been allocated a **Green** RAG rating. The UXO desk study and constraints assessment identified one UXO hazard within Route Option A2, an aircraft crash approximately 1.6 km west of Lussa Loch. It is considered that this should be avoided during Alignment Selection. There are no other UXO constraints identified within the Route Options for Zones A, B and C.

Flooding

Flooding does not present an immediate risk to the majority of the Route Options, with Route Options in Zone A and B being allocated a **Green** RAG Rating due to <2% of option length with >80% width within a 1 in 200-year flood zone. However, approximately 9.1% and 8.3% of Route Options C1 and C2 are within the 1 in 200-year flood zone therefore been allocated a **Red** RAG rating. The Route Options are generally constrained in the eastern area and can be spanned / avoided during route development.

Ground Conditions

Terrain

The terrain has been assessed by reviewing the average gradient and maximum gradients of the terrain along the centre line of each Route Option using DTM data for all Route Options these were then analysed and categorised into the RAG summary and calculated. At this stage, it is not appropriate to assess specific inclines and elevations within the Route Option. The exercise carried out at this stage assumes a full assessment of the 1 km corridor for elevation heights and DTM data to analyse sloping scenarios would be undertaken on a preferred Route Option.

Route Options A1, A2 and B2 have been allocated a **Green** RAG rating as the terrain for these routes is considered flat or generally undulating terrain. Route Options B1 and C1 have been allocated an **Amber** RAG rating as the terrain within these routes is undulating and includes areas with slopes up to 40% gradients. Route Option C2 has been allocated a **Red** RAG rating due to a full width plateau in the eastern section of the Route Option and steep mountainous terrain slopes up to 50% gradients. Route Option C1 would therefore be preferable in terms of terrain and potential for constraint (costs and construction/maintenance access) within this Zone.

Across all Route Options, it would be prudent to state that steep slopes could be mitigated / avoided during route development / alignment stage by avoiding particularly steep slope sections and traversing the route alignment down through flatter ground. Steeper slopes can also be mitigated through micro-siting and increasing height of structures accordingly. Existing topographic ground features can also mitigate severe ground sloping identified at this stage.

Peat

The majority of the Route Options have an element of peat ranging from low percentage to high within each Route Option. Route Options A1 and C1 have been allocated an **Amber** RAG rating as Class C3 peat covers between 5-20% of Route Option A1 and Class 2 peat covers between 5-20% of Route Option C1. It is considered that these areas could be avoided during alignment stage. The remaining Route Options have been allocated a **Red** RAG rating as Class 2 and C2 peat covers more than 20% of Route Option A2 and Class C2 peat covers more than 20% of Route Options B1, B2 and C2. Some areas of peat span the entire width of the Route Options and would likely be unavoidable during the OHL alignment stage. All Route Options with peat risk are potentially high risk to the OHL until depths are fully understood. OHL Alignment stage and probing would be required on all preferred routes prior to alignment studies.

Construction and Maintenance

Access

With regards to accessibility, there is an existing network of tracks and Route Options A1 and A2 are within 1 km of the existing public road network therefore a **Green** RAG Rating has been allocated. Route Options C1 and C2 have limited existing track access and most of the Route Option is over 1 km from the existing public road network therefore they have been allocated **an Amber** RAG rating. Route Options B1 and B2 have no tracks and the majority of the Route Option is over 1 km from the existing public road network, therefore both have been allocated a **Red** RAG rating.

Proximity

Wind Farms

All Route Options within Zones A and B have been allocated a **Red** RAG Rating due to the Route Option being within <750 m of a windfarm. Route Option A2 in particular poses the biggest risk as approximately the entire Route Option is within <750 m of a windfarm. Route Options C1 and C2 have been allocated a **Green** RAG rating as these are approximately >1 km from a windfarm.

A clear understanding of the proposed Cnoc Buidhe Wind Farm connection requirement which borders Tangy IV needs to be understood and evaluated in conjunction with Tangy development to avoid OHL routing restrictions particularly in relation to Route Option A2. It is anticipated that information on the Cnoc Buidhe Wind Farm would likely be available during the Alignment Selection Stage to inform this.

Communication Masts

Route Option C1 and C2 that lead to connection points at Carradale have masts located within and adjacent to the Route Option and have therefore been allocated a **Red** RAG Rating. Route Options A1 and A2 are within 750 m – 1 km of a communication mast and have therefore been allocated an **Amber** RAG Rating. The remainder of the Route Options within these Zones have been allocated a **Green** RAG rating as they are located further than 1 km from a communication mast.

Urban Environment

The overall site area is largely rural and is not densely populated with <10% of the Route Options considered to be within an urban environment. Although there are sporadic farms and individual

dwellings, these are located mostly within the east of the Study Area, following the B842 road. All Route Options have therefore been allocated a **Green RAG** Rating.

6.1.3 Economic Appraisal

The approximate construction cost of the route has been calculated based on a standard per km rate derived from SSEN Transmission's experience of similar projects.

Route Option A2 has the lowest capital cost in Zone A and has therefore been allocated a **Green** RAG rating. Route Option A1 has a higher cost, it is 139% higher than Route Option A2 and has therefore been allocated an **Amber** RAG rating. Route Option A2 has an overall low rating apart from tree felling, as Route Option A2 has a higher volume of trees compared to Route Option A1.

Route Option B1 has the lowest capital cost in Zone B and has therefore been allocated a **Green** RAG rating. Route Option B2 is significantly higher in cost; it is 187% higher than Route Option B1 and has therefore been allocated a **Red** RAG rating. Route Option B1 was allocated a **Green** RAG rating from an inspections and maintenance perspective, compared to Route Option B2 which was allocated an **Amber** RAG rating, as it was less remote in terms of access. Route Option B1 was allocated a **RED** RAG rating from a tree felling perspective due to the amount of felling required along the route.

Route Option C1 has the lowest capital cost compared in Zone C and has therefore been allocated a **Green** RAG rating. Route Option C2 has a higher cost, it is 130% higher than Route Option C2 and has therefore been allocated an **Amber** RAG rating. Both Route Options will require tree felling, however Route Option C1 has been allocated a **Red** RAG rating and Route Option C2 an Green RAG rating. Route Option C1 had a lower rating for diversions, consent mitigations, inspections and maintenance.

6.2 Route Options D and E

6.2.1 Environmental Appraisal

Natural Heritage

Designations

Route Options D and E both cross over many Ancient Woodland sites listed on the AWI along with Native Woodland sites identified in the Native Woodland Survey of Scotland. Route Options D and E both pass through the Kintyre Goose Routes SSSI, Ramsar, and SPA and the Torrisdale Cliff SSSI, with Route Option E in close proximity to the Tangy Loch SSSI and SPA. Route Option E also has several LNCSs present within it. Therefore, both Route Options have been given a **Red** RAG rating.

Protected Species

Route Option D passes through more woodland than Route Option E which can support bats, badgers, red squirrel, and pine marten along with small areas of moorland and heath. Route Option E has more grassland areas than Route Option D but also includes woodland and moor land. Both Route Options have watercourses and are proximal to marine areas which can support otter and water vole, along with more marine species. Therefore, with the potential impact on terrestrial and marine dwelling species, both Route Options are assigned an **Amber** RAG rating.

Habitats

Route Option D is predominantly woodland with areas of lowland grass and areas of moorland that could have Annex 1 priority habitats such as blanket bog and wet heath. Route Option E also has areas of woodland although less abundant and a higher abundance of grassland / agricultural areas. As both Route Options directly pass through potential Annex 1 habitats both Route Options have been given a **Red** RAG rating. There is potential for GWDTEs.

Route Option E is deemed more suitable due to the higher abundance of agricultural and grassland habitat.

Irreplaceable Habitat

Both Route Options D and E have been assigned an **Amber** RAG rating. Both options contain blanket bog and woodland listed on the AWI which are considered irreplaceable habitats. Route Option D contains significantly less irreplaceable habitat (39.76 ha) compared to Route Option E (129.86 ha).

For both Route Options it is possible that the irreplaceable habitat could be avoided at the alignment stage as irreplaceable habitats do not span the full width of either option.

Non Irreplaceable Habitat

As shown in **Table 6-4** below, Route Option D has a lower BU (8963.73) compared to Route Option E (11918.22). Both Route Options are predominantly low distinctiveness coniferous woodland and modified grassland with several grassland, woodland, wetland and heathland habitats of variable distinctiveness. Route Option E contains more high and medium distinctiveness habitats overall compared to Route Option D.

Table 6-4: Summary of total BU, area and percentage of irreplaceable habitat and overall ranking for Route Options D and E.

Option	Irreplaceable Habitat Area (ha)	Irreplaceable Habitat (% of Site)	Biodiversity Units (BU)	Ranking
Route Option D	39.76	2.24	8963.73	1
Route Option E	129.86	5.79	11918.22	2

Both Route Options D and E have been assigned an **Amber** RAG rating. Route Option D is the Preferred Option from a BNG perspective as it contains less irreplaceable habitat and has a lower BU than Route Option E.

Ornithology

Both Route Options have woodland edge habitat and moorland than can support Schedule 1 and red listed BoCC species. Greenland white-fronted geese may be present (associated with designated sites) within both Route Options and they are listed on the BoCC species red list. Moorland present in both Route Options could have the potential for ground nesting birds listed on BoCC such as hen harrier, black grouse and curlew. Due to the known presence of protected birds along with the potential for others both Route Options are assigned a **Red** RAG rating.

Hydrology, Geology and Hydrogeology

All Route Options have been assigned an **Amber** RAG rating, as each of the Route Options have the potential to compromise quality or quantity of surface waters or groundwaters, in relation to public or private water supplies, or GWDTE. However, subsequent surveys will establish specific receptors considered to be at risk.

Notwithstanding this, due to the nature of the Proposed Development, refinement of alignment, assumed construction good practice and compliance with relevant guidance, it is likely that risks associated with each of the options will be minimised.

Conclusion

In conclusion, the difference between both Route Options are relatively small, such that no one Route Options stands out as substantially better able to accommodate the Proposed Development, Route Option E is marginally more suitable due to the higher abundance of agricultural and grassland habitat compared to Route Option D which is predominantly woodland with areas of lowland grass and areas of moorland.

The Route Options have been assessed to identify key constraints for each. The assessment has taken account of the opportunities for mitigation, such as avoidance through design and the adoption of other standard working practices which, if implemented, could overcome the identified constraint.

Cultural Heritage

Designations

No Route Options have the potential for direct impact on any World Heritage Sites, Inventory GDLs or Inventory Battlefields.

Both Route Options have Scheduled Monuments within them. Route Option D has a single Scheduled Monument within it, Saddell Abbey (SM3645). It is also in close proximity to the Scheduled Monument of Rudha nan Sgarbh (SM3100) where there is potential for indirect or setting impacts on these assets.

Route Option E has four Scheduled Monuments within it:

- Saddell Abbey (SM3645);
- Ardnacross, long cairn (SM3646);
- Kilkeddan, dun (SM3109); and
- Kildonan, dun (SM243).

In addition, there is a cluster of Scheduled Monuments to the south of the Route Option E (within circa 50 m of the Route Option E) on which there is the potential for indirect or setting impacts. Route Option E has 57 undesignated assets within it and Route Option D has 16 undesignated assets within it.

Due to the presence of Saddell Abbey (SM3645) within Route Option D and its proximity to Rudha nan Sgarbh (SM3100). Route Option D has been allocated an **Amber** RAG rating for designations. Route Option E has been allocated a **Red** RAG rating for designations due to the presence of the four scheduled monuments within the Route Option and the potential for indirect setting impacts.

Cultural heritage assets

No Route Options have the potential for direct impacts on any non-inventory GDLs or Conservation Areas.

Route Option D has 10 Listed Buildings within it, these comprise seven Category B and three Category C. As a result, there is potential for indirect or setting impacts on these assets. There are additional Listed Buildings in proximity to the Route Option, the potential also exists for indirect or setting impacts on these assets. As such, Route Option D has been allocated a **Red** RAG rating.

Route Option E has 12 Listed Buildings within it, these comprise a single Category A, eight Category B and three Category C. As a result, there is potential for indirect or setting impacts on these assets. There are additional Listed Buildings in proximity to Route Option E, the potential also exists for indirect or setting impacts on these assets. As such, Route Option E has been allocated a **Red** RAG rating.

Conclusions

In conclusion, taking into consideration the direct and indirect impacts on both Designations and Cultural Heritage Assets Route Option D is preferred from a designations perspective and there is no preference between Route Option D and E for cultural heritage assets.

People

Proximity to Dwellings

There are a number of dwellings scattered throughout Route Options D and E, predominantly associated with the eastern coast and adjacent to the B842. Particular pinch points are as noted:

- Route Option D: areas around the B842 at Saddell, Torrisdale Bay and Bridgend, south of the existing substation at Carradale; and
- Route Option E: areas around the B842 at Ballochgair, Ugadale, before meeting the same route as Option Route D at Saddell, Torrisdale, Bridgend and south of the Carradale GSP

Conclusions

It is considered that there are limited opportunities to avoid encroaching in close proximity to some dwellings along the Route Option given the presence of existing 33 kV OHLs that run parallel to the B842. Dwellings located within the Route Options at Saddell and Torrisdale Bay present a particular pinch point for alignment. Route Option E however poses greater constraints in regard to the number of pinch points presented. Due to these constraints, both Route Options have been given a **Red** RAG Rating, with Route Option D being slightly preferred.

Landscape and Visual

Designations

As identified in **Section 5.2.4** above, there are no National Designations within the Study Area, although there are some which would have intervisibility with the Study Area. These are discussed below.

The North Arran WLA and North Arran NSA would be over 8 km from the Study Area and as such a wood pole line or alternatively steel lattice towers are not likely to be perceptible, particularly where backdropped by landform and forestry as the majority of Route Options D and E would be located. Route Option D and E both fall within the East Kintyre (Coast) APQ although Route Option D to a much lesser extent.

Although both Route Options would follow the existing OHL line corridor along the B842, Route Option D would have less of an impact due to affecting a smaller proportion of the APQ. Both Route Options would increase the number of OHLs within the APQ, particularly where the landscape is steep and rocky between the coast and hills limiting alignment options. Cumulative effects will therefore be a key issue here.

Route Option D is the Preferred Option over Route E as it only has potential to affect half of the extent of the East Kintyre (Coast) APQ that Route E potentially would. However, where both lie within the APQ, there is potential for the increase of number of OHLs within the APQ, to compromise the special qualities of the landscape. Taking into account it is a local landscape designation, both Route Option D and E have been given an **Amber** RAG rating.

Landscape

The majority of Route Option D falls within LCT 39: Plateau Moor and Forest – Argyll, with part of its far eastern section passing through LCT 36: Coastal Glens and LCT 53: Rocky Coastland - Argyll. Existing OHL infrastructure and existing wind turbines are an existing characteristic of this area.

The western half of Route Option D; between Tangy IV Wind Farm Substation and the summit of A Chruach, passes through the less sensitive areas of forestry, with the eastern section between A Chruach and Carradale, predominantly passing through the more sensitive open moorland of LCT 39 alongside forestry plantation on the lower western slopes of the Plateau Moor and Forest, the pastures of LCT 36 and the elevated moorland and pastures of LCT 53.

Parts of Route Option D encounter some areas of steep slopes, Ancient and Native Woodland, with limited options of avoiding these, particularly near Saddell. OHL infrastructure are an existing characteristic of this area, with several existing OHL's already running along the B842 corridor.

The majority of Route Option E falls within LCT 39: Plateau Moor and Forest – Argyll, with part of its far eastern section passing through LCT 36: Coastal Glens and LCT 53: Rocky Coastland – Argyll and

a small southern section passing through LCT 54: Low Coastal Hills. LCT 54 is an area of open, windswept farmed landscape in the south and east of Kintyre.

The far western part of Route Option E passes through the less sensitive areas of forestry; between Tangy IV Wind Farm Substation and the south of Lussa Loch, with the central and eastern sections predominantly passing along the forestry edge, through the more sensitive and open moorland of LCT 39, the pastures of LCT 36 and LCT 54 and the elevated moorland and pastures of LCT 53 between Lussa Loch and Carradale in the north. Parts of Route Option E in the north, between Saddell and Carradale encounter some areas of steep slopes, Ancient and Native Woodland, with limited options to avoid. Existing wind turbines and OHL infrastructure are an existing characteristic of this area, with several existing OHLs already running along the Glen Lussa Water Valley and the B842 corridor.

Both Route Options D and E follow the coastline north of Saddell and it is this section of landscape which is potentially most sensitive, with the landform limiting alignment options, and the presence of existing infrastructure already an intrusive feature. Both Route Options have been given a RAG rating of **Amber**. Route Option D is preferred over Route E due to its shorter extent along the more sensitive coastal landscape.

Visual

Potential visual effects from the western extents of Route Option D are limited to walkers along the Kintyre Way. Views from the Kintyre Way would be possible for a considerable extent of the path where it has potential to be in close proximity to the Route Option and where there is limited intervening forestry. There would also be a higher potential of significant visual effects from the Kintyre Way as the eastern extents pass through western Carradale.

Potential visual effects from the south western extents of Route Option E are limited to walkers on the Kintyre Way and visitors to Lussa Loch. There would be higher potential of visual effects from the Kintyre Way where the route crosses it south of Lussa Loch.

Potential visual effects from the eastern extents of Route D, and the northern section of Route E, would be limited to users of the B842, local residents in Carradale and Saddell, local residents along the B842 and local roads, people involved in other outdoor pursuits, such as users of the NCR 78. Both Route Options would be viewed in the context of several existing OHLs along the B842 corridor.

Although both Route Options have potential to significantly affect a large number of visual receptors, notably users of the Kintyre Way, B842 road, and residents in the number of settlements along the coast, Route Option D is marginally preferred as it would affect fewer visual receptors due to its shorter extent and western extents within the forestry. Both options have been given a RAG rating of **Red**.

Conclusions

Overall, considering landscape designations, character and visual amenity for Route Options D and E, Route Option D is preferred.

Land Use

Agriculture

The majority of the agricultural land within the Route Options D and E is identified as Class 6.3 which is land capable of use as rough grazing and Class 5.3 which is land use as improved grassland. Agricultural land comprising of Class 5.3 borders the majority of Route Option E between Loch Lussa and Ballochgair in the east. As the Route Options follow the B842 north along the coast, the agricultural classifications change throughout. These sections are identified as Class 4.1, land capable of producing a narrow range of crops, located from water stretches at Ardnacross Bay, Saddell Bay and Carradale Bay; areas of Class 5.1, 5.2 and 5.3, land capable of use as improved grassland, at Glen

Lussa, Saddell Glen, Torrisdale and Loch Lussa; and areas of Class 6.1, land capable of use as rough grazing along the coastline. However, as the majority of the land is not a particularly sensitive or fertile category any impacts on agriculture as a result of the route options is considered to be low. As such, both Route Options have been given a **Green** RAG rating

Forestry

Route Option D is host to approximately 950 ha of commercial conifer woodland. Specific locations of the Route have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would be minimal opportunity during the OHL Alignment Selection Stage to avoid specific areas of commercial conifer woodland and therefore it is assumed that the commercial and/or financial viability of the forestry operations within this Route Option could be compromised as a result. Route Option D has been allocated a RAG rating of **Red**.

Route Option E is host to approximately 1014 ha of commercial conifer woodland. Specific locations of the Route have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would also be significant opportunity during the OHL Alignment Selection Stage to avoid specific areas of commercial conifer woodland. Route Option E has been allocated a RAG rating of **Amber**.

Recreation

Route Option D would intersect 11 Core Paths, the Kintyre Way and NCR 78. The Route Option also runs in parallel to large sections of Core Path C088 (c, d, e, g and j), the Kintyre Way and NCR 78, which could result in a significant reduction in visual amenity for walkers and hikers. In addition, Route Option D passes immediately north of Lussa Loch which is used by walkers, hikers and anglers. All of which are likely to experience a reduced visual amenity. Due to the above constraints a RAG rating of **Red** has been allocated.

Similarly to Route Option D, Route Option E would also intersect 11 Core Paths, the Kintyre Way and NCR 78. The Route Option also runs in parallel to large sections of Core Path C088 (c, d, e and g) and NCR 78, which could result in a significant reduction in visual amenity for walkers and hikers. In addition, Route Option D passes immediately south of Lussa Loch which is used by walkers, hikers and anglers. All of which are likely to experience a reduced visual amenity. Due to the above constraints a RAG rating of **Red** has been allocated.

Conclusion

Overall, there are no distinguishable factors between Route Options D and E when considering agriculture of recreational use given their shared extents. In terms of recreational use, Route Option E would be slightly preferred to Route Option D given the route doesn't run parallel to as many core paths or cycle routes. In relation to forestry Option E is the preferred route as although it hosts more commercial conifer woodland than Route Option D, there are significant opportunities to avoid these areas during the alignment stage when compared to Route Option D. As such, Route Option E is the preferred route from a land use perspective.

Planning

Policy and Proposals

Adherence to National, Regional and Local planning policy will in part largely depend on avoiding or minimising potential constraints noted, particularly in relation to potential impacts on the natural environment given presence of designated sites and areas of landscape importance.

Route Option E is considered to have the highest risk of adverse effects due to the potential for impacts on designations including the East Kintyre (Coast) APQ, Scheduled Monuments and impacts to visual amenity for recreational users. The differences between Route Option D is relatively small

however, given the extent of Route Option E in proximity to designated sites along the coast, Route Option E has the potential for higher adverse impacts than Route Option D. Both Route Options have been allocated an **Amber** RAG rating due to the potential constraints of alignment.

At the current stage, four planning applications intersect both Route Options D and E. Route Option D intersects planning applications for a forest design plan at West Lussa Forest (18/00034/FDP), a change in turbine specification for Beinn an Tuirc Wind Farm Phase 3 (18/02775/PP), proposed underground cables at Blary Hill Farm (19/02574/S37) and the proposed Cnoc Buidhe Wind Farm. Route Option E also intersects the forest design plan at West Lussa Forest (18/00034/FDP) and Lagalgarve Forest (20/01212/FDP), a forest grant scheme at High Ugadale Woodland (19/02577/FGS) and the proposed Cnoc Buidhe Wind Farm. It is considered that these planning applications can be avoided through route alignment development however, as the boundary extents for Cnoc Buidhe Wind Farm and the Forest Development Plan at Lussa Forest cover a large portion of the Route Options, opportunities to avoid the full extents of these planning applications is limited. Both Route Options have been allocated an **Amber** RAG rating due to the potential constraints of alignment.

6.2.2 Engineering Appraisal

For the purposes of the engineering assessment, Route Option D has been assessed as a single section between Route Option A2 and C2 rather than a full end to end Route Option. Further details can be found in Tangy 132 kV Overhead Line Route Corridor Study report[27].

Infrastructure Crossings

Major Crossings and Metallic Pipes

Route Option D has been allocated **Green** RAG rating as there are no major infrastructure crossings within the Route Option. An above ground metallic pipeline runs for approximately 3.5 km along Route Option E between Cnoc nan Cadhag and Gartreillan Power Station. Additional clearance / span may be required during the alignment stage. Route Option E has therefore been allocated an **Amber** RAG rating.

Road Crossings

Route Options D and E are considered at high potential risk of constraint from roads as Route Option D has approximately 32 crossings within the Route Option and Route Option E has more than 50 crossings within the Route, including the B842. Although the B842 follows Route Option E along the coastline there are opportunities during alignment development to avoid crossing the road entirely. Both Route Options have therefore been allocated a **Red** RAG rating.

Environmental Design

Elevation

Rudimentary elevation scoring in terms of potential for the alignment to be constrained in each of the Route Options could be misleading. The Route Options are circa 1 km wide and can include within that extent an area of high elevation that may not be practical for the OHL to be routed over or near. However, there could be sufficient route remaining to enable detailed routeing (avoiding the areas of potential constraint). RAG key scoring indicates a percentage of elevation capture of a whole Route Option at maximum height of 200 m AOD. We would therefore refer to the individual Route Options centre profiles to state that all Route Options at this stage wouldn't exceed 350 m AOD and could be routed to a lower altitude if necessary, during route development stage.

Route Option E has been allocated a **Green** RAG rating as only 4.7% of the Route Option is above 200 m AOD. Route Option D has been allocated a **Red** RAG rating as 61.5% of the Route Option is above

[27] Energyline, June 2022. Tangy 132 kV Overhead Line Route Corridor Study (Version 2.0). Ref: 90SS1157-REP-003.

200 m AOD. However, as there remains almost 40% of the Route Option below 200 m AOD it is considered that there is some flexibility during the alignment stage. Route Option E is preferred from an elevation perspective.

Atmospheric Pollution

No Route Options are located in areas of high pollution therefore both Route Options have been allocated a **Green** RAG Rating.

Contaminated Land

The UXO desk study and constraints assessment identified one UXO hazard within Route Option D, a potential aircraft crash site and one in Route Option E, an anti-tank obstruction / road block along the B842 between Ugadale and Peninver. It is considered that this should be avoided during Alignment Selection, therefore an **Amber** RAG rating has been allocated. There are no other UXO constraints identified within Route Options D and E.

Flooding

Route Options D and E are considered moderate potential for development to be constrained as approximately 2.2% of Route Option D and 3.2% of Route Option E is within the 1 in 200-year flood zone associated with Carradale Water. Both Route Options have therefore been allocated an **Amber** RAG Rating.

Ground Conditions

Terrain

Route Options D and E have both been allocated an **Amber** RAG Rating due to the presence of undulating terrain with slopes up to 40% gradients. Both Route Options have the potential to have steeper slope sections avoided / mitigated at OHL alignment stage and would not be seen as an immediate risk at this stage. Steeper slopes can also be mitigated through micro-siting and increasing height of structures accordingly. Existing topographic ground features can also mitigate severe ground sloping identified at this stage.

Peat

Both Route Options D has been allocated an **Amber** RAG rating 5-20% of the Route Option is covered with peat. Less than 5% of Route Option E is covered with peat, therefore it has been allocated a **Green** RAG rating. It is considered that the areas of peat could be during alignment stage. However, both Route Options with peat risk are potentially high risk to the OHL until depths are fully understood. Alignment stage and probing would be required on all preferred routes prior to alignment studies.

Construction and Maintenance

Access

Route Options D and E have been allocated a **Green** RAG Rating in terms of accessibility due to the presence of existing tracks and road network all being within 1 km of the Route Options.

Proximity

Wind Farms

The initial section of Route Option D which runs north east from Tangy IV Wind Farm to Collusca poses a high risk to constraints as this section of the Route Option is within <750m of a wind farm. As such, Route Option D has been allocated a **Red** RAG rating. Route Option E is considered high potential for constraint, as it is within <750m of a wind farm, although it is noted that this is localised

to the Tangy IV Wind Farm location and the majority of Route Option does not encroach on any other wind farm site boundary.

Communication Masts

Route Option D is within 750 m to 1 km of a communication mast and has therefore been allocated an **Amber** RAG Rating. Route Option E is within <750 m of a communication mast and has therefore been allocated a **Red** RAG Rating.

Urban Environment

The overall site area is largely rural and is not densely populated. Although there are sporadic farms and individual dwellings located mostly within the east of the Route Options following the B842 road, both Route Options have been allocated a **Green** RAG rating as <10% of the Route Options are considered within an urban environment.

6.2.3 *Economic Appraisal*

The approximate construction cost of the route has been calculated based on a standard per km rate derived from SSEN Transmission's experience of similar projects.

Route Option D has the lowest capital cost and has therefore been allocated a **Green** RAG rating. Route Option E has a higher capital cost, it is 130% higher than Route Option D and has therefore been allocated an **Amber** RAG rating. Route D requires more tree felling than Route E, however Route Option E includes significantly more Distribution (Low Voltage) diversions as well as scoring an **Amber** RAG rating for tree felling and consent mitigations.

6.3 Preferred Route

Route Option D was preferred over Route Option E overall because it provides greater opportunities for a reasonable landscape fit, contains less sensitive visual receptors including dwellings, and is a greater distance to designated sites. It is however considered that both Route Options D and E have significantly higher impacts from an environmental perspective than Route Options following Zones A, B and C. As such, a route following Zones A, B and C has been carried forward for consideration of a Preferred Route.

6.3.1 *Zone A*

The environmental, engineering and economic Preferred Route Option was very conflicting in Zone A, however following careful consideration Route Option A1 was determined to be the Preferred Route Option.

Environmentally, Route Option A1 was preferred for the following parameters:

- Ornithology – Route Option A1 is further away from the Kintyre Goose Roosts multiple designated Site;
- Forestry – Route Option A1 contains a significantly lower amount of commercial forestry when compared to Route Option A2, therefore there would be more opportunities to avoid these areas; and
- Recreation – Route Option A1 is further away from recreational points of interest, in particular the Kintyre Way.

The key environmental determining factor was from a proposal's perspective. As shown in **Figure 5.1**, both Route Options A1 and A2 would be affected by the proposed Cnoc Buidhe Wind Farm, albeit Route Option A1 to a lesser extent. Both Route Options would also be intersected by the proposed Arnicle Wind Farm (planning application ECU00003231), however, according to the current layout plans two of the turbines fall within Route Option A2. In addition, three wind turbines associated with planning application 14/01978/PP will also fall within Route Option A2. The combination of these two

planning applications would severely constrain the OHL alignment through Route Option A2. Although Route Option A1 would intersect the proposed Arnicle Wind Farm access road, no turbines are anticipated to fall in this route.

From an engineering perspective, Route Option A1 was preferred for the following parameters:

- Peat – Route Option A1 contains less peat and the peat classification is lower when compared to Route Option A2. Through careful alignment it is considered that the areas of peat could be avoided;
- Contaminated Land – There are no areas of contaminated land or evidence of a risk of contaminated land within Route Option A1. Within Route Option A2 there a potential aircraft crash site; and
- Elevation – Elevation throughout Route Option A1 is much more favourable than Route Option A2 as only 5% of the Route Option exceeds 200m AOD.

Although Route Option A2 has the lowest capital cost, the presence of the proposed Cnoc Buidhe Wind Farm and Arnicle Wind Farm would require the undergrounding of the OHL through this area which would significantly increase the cost of Route Option A2. Therefore, Route Option A1 was preferred economically, Route Option A1 also has a significantly lower cost in terms of tree felling compared to Route Option A2.

6.3.2 Zone B

For Zone B, Route Option B1 is preferred. From an environmental perspective, Route Option B2 was preferred from the following parameters, however the differences between Route Option B1 and B2 were generally marginal:

- Habitats – Route Option B1 was preferred as it was the shorter route and crosses a smaller area of heath or blanket bog; and
- Ornithology – Route Option B1 was preferred as it contains lower levels of woodland and less moorland habitat which could be used for foraging.

The key determining factor was from a proposal's perspective, Route Option B2 would be affected by planning application 14/01978/PP and Arnicle Wind Farm (planning application ECU00003231). According to the current layout plans one turbine associated with planning application 14/01978/PP and eight turbines from the proposed Arnicle Wind Farm (planning application ECU00003231), will fall within Route Option B2. The combination of these two planning applications would severely constrain the OHL alignment.

One of the key determining engineering parameters was elevation, 42% of Route Option B1 was over 200 m AOD which is significantly better when compared to 99.8% of Route Option B2.

Route Option B1 would require a higher amount of tree feeling however, the construction cost of Route Option B1 was significantly lower that Route Option B2. Route Option B2 would also be more expensive during the operational phase due to the Route Options remote location.

6.3.3 Zone C

Route Option C1 is unanimously preferred from an overall environmental, engineering and economic perspective. Route Option C1 was preferred for the following environmental parameters:

- Designations – Route Option C1 contains no designated sites, a LNCS is present within Route Option C2;
- Protected Species – Route Option C1 was preferred as it contains lower levels of heath and bog habitat which could support protected species;
- Habitats – Route Option C1 was preferred as it crosses a smaller area of heath or blanket bog;
- Ornithology – Route Option C1 was preferred as it contains lower levels of woodland and less moorland habitat which could be used for foraging;

- Cultural Heritage Assets – No cultural heritage assets were identified within close proximity to Route Option C1; and
- Proximity to Dwellings – Although Route Option C1 contains residential dwellings, there are fewer constraints and pinch points compared to Route Option C2.

Although cultural heritage designations, forestry, recreation and policy and proposals preferred Route Option C2, the differences between the two Route Options for these parameters were marginal.

From an engineering perspective Route Option C1 would be preferred from the following parameters:

- Road Crossings – Route Option C1 requires three crossings, Route Option C2 requires eight;
- Terrain – the terrain within Route Option C1 is more preferable as it is undulating with slopes of up to 40% gradients, Route Option C2 contains steep mountainous terrain with slopes of up to 50%; and
- Peat – Route Option C1 contains less peat when compared to Route Option A2. Through careful alignment it is considered that the areas of peat could be avoided.

Route Option C1 has the lowest capital cost to construct compared to Route Option C2. Although Route Option C1 required a higher amount of tree felling, it was also less constrained from an inspections and maintenance perspective.

6.3.4 Summary

Taking into account the environmental, engineering and economic constraints a combination of **Route Option A1, B1 and C1** is considered as the overall Preferred Route and is illustrated on **Figure 6.1**.

The Preferred Route will require careful consideration during the alignment selection stage of the project to achieve an acceptable alignment with minimal environmental effects.

Should further site and desk-based analysis at the alignment selection stage identify a particular constraint, a further review of route or alignment options may be required prior to the identification of a Preferred Alignment.

7. INITIAL SITE SELECTION REPORT SUMMARY

7.1 Introduction

This section provides a summary of the Initial Site Selection Report[1] which describes the selection and high-level environmental, engineering and economic appraisal of Site Options for a new switching station or extension of the Carradale GSP to create a transmission connection between the Tangy IV Wind Farm 132 kV OHL and the existing Crossaig to Carradale 132 kV OHL (see **Figure 7.1**). The switching station and GSP will be used to connect the new Tangy IV windfarm to the grid whilst ensuring all relevant protection equipment is installed in the event of a fault.

The following elements are included as a part of the Proposed Project:

- A new switching station site operational footprint approximately 68 x 58 m in size; switchgear building of approximately 21 x 49 m; with a maximum height of 10 m. Smaller buildings would also feature within the site. It will be surrounded by a 2.4 m high metal palisade security fence;
- A new combined control and switchgear building;
- Landscaping and biodiversity requirements;
- Connection from the proposed Tangy IV Wind Farm OHL Connection to the existing Crossaig to Carradale 132 kV OHL; and
- Permanent access to the Preferred Site.

7.2 Site Selection Process

The approach to site selection was informed by SSEN Transmission's guidance on 'Substation Site Selection Procedures for Voltages at or above 132 kV' (July 2022[28]). The guidance sets out the approach for the identification and selection of new substation sites and aims to balance the environmental considerations with engineering and economic considerations throughout the site selection process.

7.2.1 Area of Search

An Area of Search was identified within which the identification of Site Options (see **Figure 7.2**) could be completed. The Area of Search was developed to enable a range of feasible Site Options within close proximity to the existing Carradale GSP and Crossaig to Carradale 132 kV OHL, as well as taking into account existing topographical, settlement and engineering constraints.

The Area of Search is a broad geographical area within which possible sites might be capable of identification within approximately 5 km of the required connectivity point (see **Figure 7.2**).

7.2.2 Site Identification and Selection Methods

Three potential Site Options were identified by SSEN Transmission within the Area of Search. In accordance with the steps outlined in SSEN Transmission's approach to substation site selection and having regard to the Holford Rules principles, the following considerations have been taken into account as far as is practicable at this stage and will be considered in more detail during subsequent assessments:

- Respect areas of high amenity value and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area;
- Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas;

[28] SSEN Transmissions (2022) Substation Site Selection Procedures for Voltages at or above 132kV.

- Use space effectively to limit the area required for development, minimising the effects on existing land use and rights of way;
- Alternative designs of substations may also be considered, e.g. 'enclosed', rather than 'open', where additional cost can be justified;
- Consider the relationship of substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints; and
- When siting substations take account of the effects of line connections that will need to be made.

In addition, principles of BNG and the mitigation hierarchy have been considered during the site selection process and will continue to inform detailed site design decisions as the project progresses.

7.2.3 Appraisal Method

Appraisal of Site Options has involved systematic consideration against the environmental, engineering and cost topic areas included in **Table 7-1**.

Table 7-1 Topic Areas Considered

Environmental Parameters	
Main Parameter	**Sub-Parameter**
Natural Heritage	Designations
	Protected Species
	Habitats
	Ornithology
	Hydrology / Geology
Cultural Heritage	Designations
	Cultural Heritage Assets
Landscape and Visual	Designations
	Landscape Character
	Visual
Land Use	Agriculture
	Woodland / Forestry
	Recreation
Planning	Policy
	Proposals
Engineering Parameters	
Main Parameter	**Sub-Parameter**
Connectivity	Existing circuits / network
	Future development possibilities
	Interface with SSE Distribution and Generation
	DNO Connection
Footprint Requirements	Technology
	Adjacent Land Use
	Space Availability

Hazards	Unique Hazards
	Existing Utilities
Ground Conditions	Topography
	Geology
Environmental Conditions	Elevation
	Salt Pollution
	Flooding
	Carbon Footprint
	SF6
	Contaminated Land
	Noise (proximity to dwellings / residential properties)
Construction Access	Substation Access Road (from public roads)
	Transformer Delivery Road
Operation and Maintenance	Access
Cost Parameters	
Main Parameter	**Sub-Parameter**
Capital	Construction
	Diversions
	Public Road Improvements
	Felling
	Land Assembly
	Consent Mitigations
Operational	Inspections
	Maintenance

7.3 Description of the Site Options

This section of the report describes each of the Site Options identified for the Stage 1 appraisal (see **Figure 7.2**). The Site Options assessed are listed (in order from north to south) and described in the following section:

7.3.1 Site Option 1

This Site Option will consist of a switching station and is located west of Tower 9 of the Crossaig to Carradale 132 kV OHL, approximately 2.1 km north west of the existing Carradale GSP. Site Option 1 is located on agricultural land and is bound by the Carradale Water to the east and open fields with blocks of woodland to the north, west and south. The centre point of this Site Option is NR787405.

7.3.2 Site Option 2

This Site Option will consist of a switching station is located west of Tower 4 of the Crossaig to Carradale 132 kV OHL, approximately 700 m north west of the existing Carradale GSP. Site Option 2 is located on agricultural land and bound by the Carradale Water to the west and open fields with scattered woodland areas to the north, east and south. The centre point of this Site Option is NR789391.

7.3.3 Site Option 3

This Site Option will consist of the installation of a new busbar immediately north of the existing Carradale GSP and will form an extension to this substation. Site Option 3 is located on agricultural land and bound by the Carradale Water to the west and the B842 to the east. The centre point of this Site Option is NR793386.

7.4 Baseline Conditions

7.4.1 Environmental Constraints

This section summarises the baseline information and key constraints for each of the environmental topics relevant to the Site Options. **Figures 7.3a – d** show the key constraints within the Study Area.

Natural Heritage

Designations

The three Site Options are not within any designated sites. The closest statutory designated site is the Torrisdale Bay SSSI approximately 3 km south of Carradale GSP. Carradale GSP is alongside woodland listed within the AWI, although separated by a minor road, the B842.

Protected Species

An ecological desk study identified records of several European Protected Species (EPS), protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended)[29], those identified as priority species on the Scottish Biodiversity List[30] (SBL) and / or protected under national legislation such as the Wildlife and Countryside Act 1981[31] as amended (WCA) or Protection of Badger Act 1992[32] (PBA). The identified species / species groups include:

- Bats (EPS and SBL);
- Badger (PBA);
- Red squirrel (WCA and SBL);
- Pine marten (WCA and SBL);
- Otter (EPS and SBL);
- Water vole (WCA and SBL);
- Reptiles (WCA and SBL);
- Amphibians (EPS and SBL); and
- Fish (SBL).

Habitats

All three Site Options will be located within semi-improved grassland used for livestock grazing. All three locations are in proximity to a major watercourse, the Carradale Water, and associated riparian habitat including Native and Ancient Woodland. The approximate distances to the Carradale Water from Site Options 1, 2 and 3 are 120 m, 40 m and 30 m respectively.

Ornithology

A breeding bird survey to inform the Carradale GSP upgrade[17] recorded a variety of passerine (songbird) species mainly outwith the foot print of Site Option three in woodland to the east of the

[29] The Conservation (Natural Habitats, &c.) Regulations 1994. [online] Available at: https://www.legislation.gov.uk/uksi/1994/2716/contents/made (Accessed 25 July 2022).

[30] The Scottish Biodiversity List is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, as required by the Nature Conservation (Scotland) Act 2004.

[31] Wildlife and Countryside Act 1981. [online]. Available at: https://www.legislation.gov.uk/ukpga/1981/69 (Accessed 25 July 2022).

[32] Protection of Badger Act 1992. [online]. Available at: https://www.legislation.gov.uk/ukpga/1992/51/contents (Accessed 25 July 2022).

B842. Semi-improved grassland within the foot print of Site Option 3 was not noted to support any ground nesting birds at the time of the survey, although scrub bordering this Site Option was noted to support breeding passerines. A sand martin *Riparia riparia* colony and an oystercatcher *Haematopus ostralegus* sitting on eggs were noted along the banks of the Carradale Water approximately 30 m and 120 m from the location of Site Option 3 respectively.

Given the similarities of habitat within and surrounding all three Site Options, a similar range of bird species as recorded during the bird survey to inform the Carradale GSP upgrade[Error! Bookmark not defined.] is anticipated to occur at all three locations[Error! Bookmark not defined.]. No Schedule 1 birds of prey were recorded during surveys to inform the Carradale GSP upgrade[Error! Bookmark not defined.]. The ZoI for disturbance impacts to nesting Schedule 1 birds of prey varies depending on the species involved, the scale and nature of the works being undertaken and local topography. The maximum extent of the ZoI is in the range of 500 m – 1 km. Taking account of the habitats present within and surrounding the Proposed Project, and the scale of the Proposed Project, Schedule 1 birds of prey are unlikely to be nesting within a ZoI of all three Site Options.

Hydrology and Geology

Hydrology

The BGS GeoIndex viewer indicates all Site Options are underlain by the Southern Highland Group low productivity aquifer, where small amounts of groundwater may be present in the near surface weathered zone and in secondary fractures. The SEPA Water Classification Hub[33] indicates that all Site Options are underlain by the Oban and Kintyre groundwater body (ID: 150698), which was classified under the Water Framework Directive (WFD) as having a Good status in 2020.

All Site Options are within the hydrological catchment of the Carradale Water and are situated immediately adjacent, with Site Option 1 located 120 m from its banks and both Site Options 2 and 3 within 50 m. The watercourse is designated by SEPA (Carradale Water / Narrachan Burn (ID: 10241) under the WFD and was classified in 2020 as having a WFD overall status of Good.

The Scottish Government drinking water protected areas – Scotland river basin district maps[34] indicates that each of the Site Options are located within drinking water protected areas for both surface water and groundwater.

Argyll and Bute PWS data indicates that there are no PWS hydrologically connected to any of the Site Options.

There is the potential for the presence of Groundwater Dependent Terrestrial Ecosystems (GWDTE) in the area; however, the predominant sources of water in this location are anticipated to be rainfall and the adjacent influence of Carradale Water.

Geology

All Site Options are underlain by Beinn Bheula Schist Formation – Gritty Psammite and Pelite. In addition, Site Options 1 and 2 are underlain by River Terrace Deposits – gravel, slit and clay. Whereas Site Option 2 is also underlain with Alluvium -clay, silt, sand and gravel.

7.4.2 *Cultural Heritage*

Designations

There are no World Heritage Sites, Inventory Battlefields or Inventory GDLs within 3 km of the Site Options.

[33] The Scottish Environment Protection Agency (SEPA) Water Classification Hub [online]. Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/ (Accessed 14 July 2022).

[34] The Scottish Government drinking water protected areas - Scotland river basin district: maps [online]. Available at: https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/ (Accessed 14 July 2022).

There are four Scheduled Monuments within 3 km of the Site Options and a further 13 undesignated assets are located within 500 m of the Site Options.

Cultural Heritage Assets

There are no Conservation Areas within 3 km of the Site Options.

There are 11 Listed Buildings within 3 km of the Site Options, comprising Category B and C Listed Buildings.

7.4.3 *Landscape and Visual*

Designations

There are no national landscape designations within the Area of Search.

The nearest NSA is the North Arran NSA[35], which lies approximately 3 km east of the Area of Search, across the Kilbrannan Sound on the Isle of Arran.

At a regional level, Local Authorities may designate landscapes considered to be of regional importance for their scenic qualities through a Local Development Plan. Argyll and Bute Council have designated regionally important landscapes as APQ[36]. The East Kintyre APQ lies within the Area of Search, approximately 3 km from Site Option 1, approximately 1.7 km from Site Option 2 and approximately 900 m from Site Option 3.

Landscape Character

Landscape Context

The Area of Search comprises two Landscape Character Types (LCTs): Coastal Glens LCT 36 and Plateau Moor and Forest LCT 39.

Within the Area of Search, the Coastal Glens LCT runs along its centre following the course of the Carradale Water in a north south direction. The existing Carradale GSP and Crossaig to Carradale OHL lie within the LCT and are both prominent features within the landscape.

The Plateau Moor and Forest LCT lies to the west and east of the Area of Search, providing an enveloping backdrop of forested slopes along the river valley, and creating a sense of enclosure and naturalness.

Visual

The nature of the views available in the Area of Search are generally determined by a combination of topography and forestry cover. Views are generally directed along the Carradale Water valley and towards the surrounding forested slopes. Views of the sea and of the Isle of Arran across the Kilbrannan Sound to the east are available from higher topography and from the Carradale Bay and the low-lying valley surrounding the mouth of Carradale Water.

The types of potential visual receptors within the Area of Search include:

- Residential receptors – both scattered individual properties and small settlements;
- Recreational receptors – people using the countryside for outdoor recreation; and
- Transport receptors – people travelling through the area on major and minor roads.

Residential receptors would be the people living in the scattered residential properties along the river valley (namely Auchenfraoch, Brackley Cottage and Farm, Lag Kilmichael, Rhodale, Auchsanavil Farm,

[35] Scottish Natural Heritage (2010). The special qualities of the National Scenic Areas. [online]. Available at: (https://www.nature.scot/sites/default/files/2017-07/Publication%202010%20-%20SNH%20Commissioned%20Report%20374%20-%20The%20Special%20Qualities%20of%20the%20National%20Scenic%20Areas.pdf (Accessed 25 July 2022).

[36] Argyll and Bute Council (2022). Argyll and Bute Modified Finalised Draft Local Plan. [online]. Available at: https://www.argyll-bute.gov.uk/moderngov/mgconvert2pdf.aspx?id=36829 (Accessed 25 July 2022).

and Barnfield Cottage) as well as people living in the settlements of Grogport, Bridgend, Waterfoot, Carradale and Airds.

The Kintyre Way and NCR 78, which also forms part of the Caledonia Way long distance cycle route runs along the B842 within the Area of Search. People travelling along these routes, as well as users of the many core paths, woodland trails, riverside and water-based activities (including fishing) are the main recreational receptors within the Area of Search.

The B842 runs on a north-south direction along the eastern edge of the Carradale Water valley, and it is the main road within the Area of Search, together with its spur the B879 from Carradale to Airds. People travelling along these roads would be potential transport receptors.

7.4.4 *Land Use*

Agriculture

Agricultural land is predominantly a mix of Class 4.2, 5.1, 5.3, 6.1 and 6.3 agricultural land, classified by the Macaulay Land Use Research Institute[37].

Woodland / Forestry

The Area of search is not located within any stands of commercial or native woodlands, while there is woodlands within close proximity to the Area of Search these should not be affected unless access is taken through the woodlands or works out with the proposed footprint.

Recreation

The Area of Search lies within an area of breath-taking scenery, which is of high recreational interest for walkers, cyclists, hillwalkers and equestrians.

The Kintyre Way and NCR 78, which forms part of the Caledonia Way long distance route, and a number of other core paths are located within the Area of Search.

Century Wood, Crow Wood and Forest Walk are popular hiking areas which are located to the east B842. Other points of interest include Deer Hill (Cnoc nan Gabhar), caravan parks and beaches.

7.4.5 *Planning*

Policy

National Policy

Scotland's third National Planning Framework (NPF3)[38] was published by the Scottish Government in June 2014. NPF3 is the long-term strategy for Scotland and is the spatial expression of the Government's Economic Strategy and plans for development and investment in infrastructure. NPF4 is currently being drafted and is scheduled to be adopted in Summer 2022.

Scottish Planning Policy (SPP)[39] was also published June 2014 (and revised in December 2020). The SPP is a statement of Scottish Government policy on how nationally important land use planning matters should be addressed. In particular, SPP Policy 154 states that

"the planning system should:

[37] The James Hutton Institute: Land Capability for Agriculture in Scotland, N/A. Land Capability for Agriculture in Scotland. [online]. Available at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland (Accessed 25 July 2022).

[38] The Scottish Government (2014). Scotland's Third National Planning Framework. [online]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2014/06/national-planning-framework-3/documents/00453683-pdf/00453683-pdf/govscot%3Adocument/00453683.pdf (Accessed 25 July 2022).

[39] The Scottish Government (2020). Scottish Planning Policy. [online]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2020/12/scottish-planning-policy/documents/scottish-planning-policy/scottish-planning-policy/govscot%3Adocument/scottish-planning-policy.pdf (Accessed 25 July 2022).

... support the development of a diverse range of electricity generation from renewable energy technologies – including the expansion of renewable energy capacity..."

Regional and Local Policy

The current development plan for the region is set out in the Argyll and Bute LDP (2015)[40]; the plan provides policies and proposals for delivering local economic and social regeneration; conservation end enhancement of the outstanding quality of the natural, historic and cultural environment; improvement of housing, transport and resources; and reducing their carbon footprint.

There are several policies on the protection of cultural and environmental assets, infrastructure and development that may be relevant in the consideration of this proposal. These include:

- Policy LDP 3 – Supporting the Protection, Conservation and Enhancement of our Environment;
- Policy LDP 6 – Supporting the Sustainable Growth of Renewables;
- Policy LDP 9 – Development Setting, Layout and Design;
- Policy LDP 10 – Maximising our Resources and Reducing Our Consumption; and
- Policy LDP 11 – Improving our Connectivity and Infrastructure.

Proposals

A search for planning applications was undertaken 13th July 2022 using the Argyll and Bute planning portal. This considered developments recorded within the Area of Search which have been submitted or approved within the last five years. Identified planning applications are provided below:

- 18/00034/FDP – Forest Design Plan and screening consultation; located 3 km south west of Site Option 3; and
- 21/01907/PAN – Proposal of application notice for the construction of a battery storage facility up to 50 MW, access track, energy storage equipment, meter building, security cameras, fencing and planting of trees; located immediately north of Site Option 3.

7.4.6 *Engineering Constraints*

Key engineering constraints are associated with the lack of future opportunities to expand the switching station or Carradale GSP extension due to the surrounding topography and capacity issues on the Carradale to Crossaig OHL. The presence of Carradale Water and associated flood plain to the west of the Site Options constrains them as a result of likely poor bedrock, space availability and flood risk. The impact of the carbon footprint of Site Options 1 and 2 is also a key constraint.

No transformers are required for the Proposed Project; therefore, transformer delivery routes will not be assessed any further in this report.

7.4.7 *Economic Constraints*

Regulated Company

SSEN Transmission owns and maintains the electricity transmission network across the north of Scotland and holds a license under the Electricity Act 1989 to '***develop and maintain an efficient, co-ordinated and economical electricity transmission system in its licensed area***'. SSEN Transmission are regulated by Ofgem, who determine how much revenue SSEN Transmission can earn from customers to cover the cost of maintaining and reinforcing the electricity network.

[40] The Scottish Government (2015). Local Development Plan. [online]. Available online: https://www.argyll-bute.gov.uk/planning-and-environment/local-development-plan (Accessed 25 July 2022).

Ultimately the costs associated with development, operation and maintenance of the Transmission systems form part of the energy user's bill. Further information on how SSEN transmission are Regulated be found here: https://www.ssen-transmission.co.uk/information-centre/industry-and-regulation/

Maintenance of Supply

SSEN Transmission are required to maintain a reliable network. The purpose of the switching station or extension of the Carradale GSP is to connect the new Tangy IV Wind Farm OHL Connection to the grid whilst ensuring all relevant protection equipment is installed in the event of a fault.

Assumptions and Limitations

Due to the early stage of the project limited information was available to make a cost comparison appraisal, resulting in the requirement to make very high-level assumptions for each of the cost comparison elements considered. More detailed cost estimates of the investment required to build the switching station will be derived as the project progresses.

7.5 Comparative Appraisal

7.5.1 Environmental Appraisal

Natural Heritage

Designations

All three Site Options are not within any designated sites nor do they have potential to be hydrologically connected to any designated sites. Therefore, all three Site Options have been allocated a RAG rating of **Green** as they are considered unlikely to compromise the conservation status or designating features of any protected sites.

Protected Species

All three Site Options have the potential to be within a ZoI of protected species, namely places of shelter for otter on the Carradale Water. In addition, Site Option 3 is within a ZoI of disturbance for a known soprano pipistrelle bat roost within a building in the Carradale GSP. All three Site Options have been allocated a RAG rating of **Amber** due to their proximity to suitable habitat for otter while additionally, Site Option 3 is in proximity to a known bat roost. Site Option 3 is marginally the least preferred Site Option due to this potential additional constraint.

Habitats

All three Site Options are located within semi-improved grassland used for livestock grazing and anticipated to be of low value for biodiversity. Therefore, all three Site Options are allocated a RAG rating of **Green**. Site Option 1 is marginally preferred as it is the furthest from the Carradale Water, reducing the potential for impacts to this watercourse e.g., pollution events.

Ornithology

All three Site Options are located within, and surrounded by, similar habitats and are anticipated to hold similar species. Based on the findings of a bird survey to inform the upgrade to the Carradale GSP[17] ornithological interest is likely to be limited and impacts mitigated through standard methods set out in the SSE bird Species Protection Plan e.g., nesting bird checks. Therefore, all three Site Options are allocated a RAG rating of **Green**. as they unlikely to compromise the status of bird species of elevated conservation importance. Site Option one is marginally preferred as it is the furthest from the Carradale Water, reducing the potential for impacts to species breeding along this watercourse, namely sand martin, and oystercatcher.

Hydrology and Geology

All Site Options have the potential to compromise quality or quantity of surface waters or groundwaters, in relation to public or private water supplies, or GWDTE. However, subsequent surveys will establish specific receptors considered to be at risk. On this basis, all three Site Options have been assigned an **Amber** RAG rating.

Conclusion

From Natural Heritage perspective, Site Option 1 is marginally more preferred but with little difference to Site Option 2. Site Option 3 is the least preferred due to its proximity to a known bat roost. There is no distinguishing factor in terms of a preferred site from a hydrology and geology perspective.

Cultural Heritage

The Site Options have been assessed to identify key constraints for each. The assessment has taken account of the opportunities for mitigation, such as avoidance through design and the adoption of other standard working practices which, if implemented, could overcome the identified constraint.

Designations

Multiple archaeological investigations have been conducted in the area of Site Option 3, concluding a concentrated presence of prehistoric activity. Site Option 3 also has an increased likelihood of subsurface archaeology given the presence of nearby designations but is otherwise clear of any anticipated adverse impacts. Given the concentration of prehistoric activity in this area, there is likely to be unidentified subsurface archaeology. Therefore, Site Option 3 has been given a RAG rating of **Amber**.

Site Options 1 and 2 are unlikely to have any indirect impacts due to distances from nearby designations. The designations are of post-medieval date and encountering subsurface archaeology is possible, but diminished given the nature of these assets. Therefore, Site Options 1 and 2 have been allocated RAG rating of **Green**.

Cultural Heritage Assets

All Site Options are located a distance away from the listed buildings included in this assessment. There are unlikely to be any visual or setting impacts due to the distance and topography. Therefore, Site Options 1, 2 and 3 have been allocated a RAG rating of **Green**.

Conclusion

Site Options 1 and 2 are located 2 km and 700 m north of Carradale GSP respectively and encounter no additional Cultural Heritage Assets. The increased distance also makes visual impacts unlikely. While all Site Options have a potential to encounter subsurface archaeology, Site Option 3 has a higher potential given the nature of the designated assets.

On balance, taking into consideration the known assets within and around each Site Option, Site Options 1 and 2 are preferred in terms of potential effects on designations and cultural heritage.

Landscape and Visual

Designations

Distance, topography and woodland cover to the east of the options would provide screening from the North Arran NSA and therefore it is unlikely that any of the options will compromise the special qualities of the NSA.

The East of Kintyre APQ lies to the south of all options, approximately 1 km at the closest point by the existing Carradale GSP. Distance, topography and screening vegetation along the river valley would limit the potential for all options to compromise the special quality of the APQ.

All Site Options have been allocated a RAG Rating of **Green**.

Landscape Character

Site Option 1 is located approximately 2 km to the north west of the existing Carradale GSP and by Tower 9 of the Crossaig to Carradale OHL, on the lower slopes to the west of Carradale Water, where the Plateau Moor and Forest LCT transitions into the Coastal Glens LCT. Existing vegetation would provide some mitigation for Site Option 1 within the river valley, however Site Option 1 would extend the presence of infrastructure along the river valley and it may compromise some of the key characteristics of both LCTs such as *"the narrow glens, with a small, domestic scale, steeply enclosed by forested ridges, or the meandering rivers which are a focus on the floor of the glen"* [41] in The Coastal Glens LCT; and the *"small enclosed pastures and occasional farms and houses on lower hill slopes at the transition with adjacent character types and within the narrow glens which dissect these uplands"* [42] in the Plateau Moor and Forest LCT.

Site Option 1 may also cause cross landscape boundary effects, and therefore it has been allocated a RAG Rating of **Amber** and it is the least preferred of the Site Options from a landscape character perspective.

Site Option 2 is located approximately 570 m to the north west of the existing Carradale GSP and by Tower 4 of the Crossaig to Carradale OHL. Site Option 2 would be perceived in the context of existing energy infrastructure, but it would also increase its presence on the river valley and within the Coastal Glens LCT. Due to its proximity to Carradale Water, Site Option 2 may compromise some of its key characteristics such as the meandering river as a focus on the floor of the glen, and therefore it has been allocated a RAG Rating of **Amber**.

The Site Option with the least potential to have any effects on the LCTs within the Area of Search is Site Option 3. As an extension of the existing Carradale GSP, Site Option 3 would slightly increase the presence of infrastructure within the LCT, but it would also be perceived in the context of existing infrastructure. It is unlikely that Site Option 3 will compromise any of the key characteristics of the LCT and therefore it has been allocated a RAG rating of **Green**.

Visual

Site Option 1 sits on higher ground over the river valley, on the lower slopes of Cnoc na h-Aine and approximately 200 m from residential receptors at Lag Kilmichael. Due to its location on higher topography, Site Option 1 could potentially be visually intrusive for sensitive receptors across the wider area, including people pursuing outdoor recreational pursuits like travelling along the Kintyre Way or the NCR 78, or people travelling along the B842. Although there is potential for mitigation planting around it, Site Option 1 is likely to compromise the visual amenity of a small number of sensitive receptors, and therefore it has been allocated a RAG Rating of **Amber.**

Site Option 2 sits approximately 200 m from residential receptors such as Barnfield Cottage and Rhonadale, and approximately 400 m from Auchnasavil Farm, all of which would have direct or partially screened views of the Proposed Development in the context of the Crossaig to Carradale OHL. Although there is potential for mitigation planting around this Site Option, Site Option 2 is likely to compromise the visual amenity of a small number of sensitive receptors, and therefore it has been allocated a RAG Rating of **Amber**.

The Site Option with the least potential to compromise the visual amenity of identified visual receptors is Site Option 3. As an extension of the existing Carradale GSP, Site Option 3 would be

[41] NatureScot (N/A). SNH National Landscape Character Assessment, Landscape Character Type 36 – Coastal Glens. [online]. Available at: https://www.nature.scot/sites/default/files/LCA/LCT%20036%20-%20Coastal%20Glens%20-%20Final%20pdf.pdf (Accessed 26 July 2022).

[42] NatureScot (N/A). SNH National Landscape Character Assessment, Landscape Character Type 39 – Plateau Moor and Forest. [online]. Available at: https://www.nature.scot/sites/default/files/LCA/LCT%20039%20-%20Plateau%20Moor%20and%20Forest%20-%20Final%20pdf.pdf (Accessed 26 July 2022).

perceived in the context of existing infrastructure, and it would not be visually very intrusive for any of the identified receptors and has been allocated a RAG Rating of **Green**.

Conclusions

Taking into account the findings of this assessment, Site Option 3 is the Preferred Option from a landscape and visual point of view. As an extension of the existing substation, Site Option 3 is the least likely to cause any impacts on the landscape character or the visual amenity of the Area of Search.

Site Options 1 and 2 would extend the presence of energy infrastructure along the Carradale Water valley, affecting both the sensitive landscape character and the visual amenity of sensitive receptors. Although mitigation planting would be possible to reduce the landscape and visual impact of these Site Options, it is likely that they would require access tracks that have not been considered as part of this assessment and which would increase the potential impact of both Site Options.

Land Use

Agriculture

Site Options 1 and 2 are both located on Class 4.2 agricultural land (land capable of producing a narrow range of crops) and Site Option 3 is located on Class 6.1 agricultural land (land capable of use as rough grazings with a high proportion of palatable plants). As all three Site Options are located on land that is considered not sensitive or fertile, the impact on agriculture is considered to be low, therefore a **Green** RAG rating has been allocated.

Woodland / Forestry

There are no areas of forestry within any of the Site Options, forestry may be affected by works outwith the site boundary or if access is taken through surrounding woodlands, but these are of non-commercial interests. Therefore, all three Site Options has been allocated a **Green** RAG rating.

Recreation

None of the Site Options intersect any core paths, however the Kintyre Way, NCR 78 and core path C088 – Campbeltown to Cloanaig follows the B842 adjacent to Site Option 3. Core path C093 – Carradale Forest circular is approximately 200 m east of Site Option 3 at its closest point to the Site Options. In addition, core paths C094 – Tayinloan – Carradale East-West Link, C097 – Carradale Bay circular, C403 – Port na Cuile – Seneval Wood, C404 – Port na Cuile, C405 – Port Tigh and C440 – Cycle Path also fall within the Area of Search. Although the Site Options will not sever any core paths, they are likely to be viewed from these core paths which could result in users experiencing a reduction in visual amenity. Therefore, all Site Options have been allocated an **Amber** RAG Rating. Site Option 3 is the Preferred Site as it is an extension to the existing substation meaning views from the routes are already dominated by the existing infrastructure and would not likely experience a significant change.

Conclusion

Overall, there is no distinguishable factor between the Site Options when considering agriculture or forestry. In terms of recreational use, Site Option 3 is the Preferred Site as it is an extension to the existing substation meaning receptors would not likely experience a significant change due to the proposed infrastructure.

Planning

Policy

Adherence to National, Regional and Local planning policy will, in a large part, depend on avoiding or minimising potential constraints noted, particularly in relation to potential impacts on the natural environment. All three Site Options are located on agricultural fields and are in close proximity to

Carradale Water and may be contrary with Policy LDP 3 – Supporting the Protection, Conservation and Enhancement of our Environment. Therefore, all three Site Options have been allocated an **Amber** RAG rating.

Planning

One planning application (21/01907/PAN) is located immediately north of Site Option 3, therefore there is a moderate risk that this application and the Proposed Project could interact. Therefore, Site Option 3 has been allocated an **Amber** RAG rating. There are no planning applications in close proximity to Site Options 1 and 2, therefore there is a low risk the Proposed Project could be constrained. Therefore, Site Options 1 and 2 has been a **Green** RAG rating.

7.5.2 Engineering Appraisal

Connectivity

Existing Circuits / Network

Site Option 1 is within 1 km of highest voltage connecting circuit and no significant constraints between point of connection and site, as such a **Green** RAG Rating has been allocated. Both Site Options 2 and 3 are considered to be constrained due to the presence of Carradale Water and non-standard pole arrangement at Site Option 2 and the need for works through a flood plan at Site Option 3. As such Site Options 2 and 3 have been allocated an **Amber** RAG Rating.

Future Development Possibilities

A switching station is unlikely to be expanded at Site Options 1 and 2 due to capacity on RC1 circuit being exceeded. As such, Site Options 1 and 2 have been allocated a **Red** RAG rating. Expansion of the Carradale GSP at Site Option 3 is considered to be constrained by the surrounding topography and existing infrastructure and has therefore been allocated an **Amber** RAG rating.

Interface with SSE Distribution and Generation

There is limited Distribution assets in close proximity to the proposed switching station or extension to Carradale GSP, other than the existing Distribution assets within Carradale GSP itself and no SSE Generation assets within close proximity. All Site Options are considered to be low risk to SSEN distribution and generation assets and have therefore been allocated a **Green** RAG Rating.

DNO Connection

DNO connections are available within <1 km of all Site Options, therefore a **Green** RAG Rating has been allocated.

Footprint Requirements

Technology

All Site Options are considered to have space available to accommodate technology. Site Option 1 and 2 are considered to have space available west of RC1 circuit for the new switching station. Site Option 3 is considered to have space for a new bay on the east of the circuit but may require some underground of the new OHL in areas where it crosses the existing OHL. All Site Options have been allocated a **Green** RAG rating.

Adjacent Land Use

Site Option 1 is considered to have space available west of the RC1 circuit to accommodate ancillary infrastructure where required. Site Option 3 is also considered to have space available within the existing compound laydown area north of Carradale GSP which would be utilised where required. As such, Site Option 1 and 3 have been allocated a **Green** RAG rating. Site Option 2 is considered to have

limited space available west of the RC1 circuit due to existing OHL and Carradale Water, whilst there is space to build the switching station itself the connection into said switching station would require a non-standard pole arrangement. As such, Site Option 2 has been allocated an **Amber** RAG rating.

Space Availability

Both Site Option 1 and 3 are considered to have space available for an optimal site design to be accommodated and have therefore been allocated a **Green** RAG rating. Due to the presence of Carradale Water adjacent to Site Option 2, a non-standard pole arrangement is likely to be required for entry of the new OHL into the switching station. As such, Site Option 2 has been allocated a **Red** RAG rating.

Hazards

Unique Hazards

There are no unique hazards present for Site Options 1 and 3, therefore a **Green** RAG rating has been allocated. The Carradale Water adjacent to Site Option 2 is considered to provide constraint to the pole arrangement and therefore a non-standard pole arrangement for entry to the new switching station would likely be required. As such, Site Option 2 has been allocated a **Red** RAG rating.

Existing Utilities

Site Options 1 and 2 would require a non-standard SSEN modification to the top crossarm to achieve wire clearances for Tower 9 and Tower 4 of the Crossaig to Carradale OHL respectively. Site Option 3 would require the undergrounding of the new OHL under the existing RC1 / RC2 within a flood plain which could be challenging. As such all Site Options have been allocated an **Amber** RAG rating.

Ground Conditions

Topography

All Site Options are considered to be on flat ground and therefore have been allocated a **Green** RAG rating.

Geology

Site Option 1 poses no obvious constraints in terms of peat or bedrock quality and has therefore been allocated a **Green** RAG rating. Site Option 2 is situated next to Carradale Water and likely poor bedrock quality. Site Option 3 is situated on / near a flood plain and is therefore likely to poor bedrock quality. As such, Site Option 2 and 3 have been allocated an **Amber** RAG rating.

Environmental Conditions

Elevation

All Site Options have been allocated a **Green** RAG rating as the sites are all below 100 m Above Ordnance Datum (AOD). Site Option A is located at 24 m AOD, Route Option 2 at 9 m AOD and Route Option 3 at 12 m AOD.

Salt Pollution

All Site Options are located within 3 km of the coastline and are therefore susceptible to salt pollution, all three Site Options have been allocated a **Red** RAG rating.

Flooding

Site Option 1 is located within a 1 in 1000-year flood zone and in close proximity to a 1 in 200-year flood zone, therefore an **Amber** RAG rating has been allocated. Site Options 2 and 3 both fall within a 1 in 200-year flood zone and have therefore been allocated a **Red** RAG rating.

Carbon Footprint

As Site Option 3 is an extension to the existing Carradale GSP, this option has the lowest carbon footprint and has therefore been allocated a **Green** RAG rating. Site Options 1 and 2 both involve new infrastructure which will result in a higher carbon footprint, both Site Options are expected to have more than a 140% higher carbon footprint than Site Option 1. Therefore, Site Options 1 and 2 have been allocated a **Red** RAG rating.

SF6

All three Site Options will utilise SF6 gas within the switchgear and busbars, therefore all options have been allocated a **Green** RAG rating.

Contaminated Land

No Site Options are located in area of contaminated land; therefore, all three Route Options have been allocated a **Green** RAG rating.

Noise (Proximity to Dwellings / Residential Properties)

There are scattered residential dwellings along the B842, however given the existing noise levels from the B842 and the distance between the residential dwellings and Site Options, it is thought that residential dwellings are at low risk of noise impacts. Therefore, all three Site Options have been allocated a **Green** RAG rating.

Construction Access

Substation Access Road (from public road)

Site Option 3 has been allocated a **Green** RAG rating, as the access to the existing Carradale GSP can be utilised. Site Options 1 and 2 are located in areas with no existing infrastructure, therefore a new permanent access will be required from the B842. Both Route Options 1 and 2 have been allocated an **Amber** RAG rating.

Operation and Maintenance

Access

All Site Options are within 1 km of well-maintained public roads; therefore, a **Green** RAG rating has been allocated.

7.5.3 Economic Appraisal

Site Option 3 has the lowest capital cost across the three Site Options and has therefore been allocated a **Green** RAG Rating. Site Option 1 and 2 both have significantly higher construction costs at 185% higher than Site Option 3 and have therefore been allocated a **Red** RAG rating for construction, land assembly and consent mitigations. Site Option 1 and 2 have been allocated **Red** RAG ratings for land assembly and consent mitigations as these would be new sites which require new transmission infrastructure whereas Site Option 3 is an upgrade to the existing Carradale GSP and therefore is an existing SSEN Transmission substation.

There are low costs associated with tree felling, public road improvements and diversions across all three Site Options and therefore these have been allocated a **Green** RAG Rating. In addition, a **Green** RAG Rating has been allocated for inspections and maintenance across all three Site Options due to low impacts across each option.

7.5.4 Preferred Site Option

From an environmental perspective, Site Options 1 or 2 are preferred due to the presence of known bat roosts at the existing Carradale GSP, the presence of planning applications near Carradale GSP and the increased likelihood of sub-surface archaeology given the presence of nearby cultural heritage designations. Site Option 3 is also likely to have a concentrated presence of prehistoric activity given previous archaeological investigations undertaken in the area. Site Option 3 is however preferred from a landscape perspective as the landscape character and visual impacts are lower due to the presence of existing infrastructure.

From an engineering perspective, Site Option 3 is preferred. This is primarily due to the requirement of a large indoor switching station having a larger carbon footprint. Although Site Option 3 has some technical difficulties, such as its position in the 1 in 200-year flood zone, it is still considered that this Site Option has an overall lower risk.

Site Option 3 is a clear preference from an economic perspective as it has the lowest capital cost of all three Site Options. Site Options 1 and 2 have a high land assembly and consent mitigations impact as both are located in areas which will require new transmission infrastructure. As Site Option 3 is an extension to the existing Carradale GSP, this option has a low impact rating.

On balance, it is considered that Site Option 3 is the overall Preferred Site.

8. CONSULTATION ON THE PROPOSALS

SSEN Transmission places great importance on, and is committed to, consultation and engagement with all parties, or stakeholders, likely to have an interest in proposals for new projects such as this. Stakeholder consultation and engagement is an essential part of an effective development process.

8.1 Questions for Consideration by Consultees

When providing your comments and feedback, SSEN Transmission would be grateful for your consideration of the questions below:

- Has the need for the Project been adequately explained?
- Has the approach taken to select the Preferred Route been adequately explained?
- Are there any factors, or environmental features, that you consider may have been overlooked during the Preferred Route selection process?
- Do you feel, on balance, that the Preferred Route selected is the most appropriate for further consideration at the alignment selection stage? Please provide an explanation of your answer.
- If you don't agree to our Preferred Route which of the options would you consider the best option for SSEN Transmission to develop? Please provide an explanation of your answer.

8.2 Next Steps

A face to face public consultation event will be held on 23rd August 2022 and a virtual online consultation event will take place week commencing 29th August 2022. The responses received from these consultation events, and those sought from statutory consultees and other key stakeholders, will inform further consideration of the route options put forward, and the confirmation of the Preferred Route to take forward to the next stage in the routeing process (alignment selection).

All comments are requested by 23rd September 2022. A Report on Consultation will be produced which will document the consultations received, and the decisions made in light of these responses.

Following the identification and confirmation of a proposed route, further technical and environmental surveys (e.g. Phase 1 Habitat / National Vegetation Classification surveys, Protected Species Surveys and further input by landscape, ecology, cultural heritage) would be undertaken to identify a preferred alignment.

Consultation on a Preferred Alignment will be undertaken in a similar manner to the identification of a Preferred Route in Spring 2023.

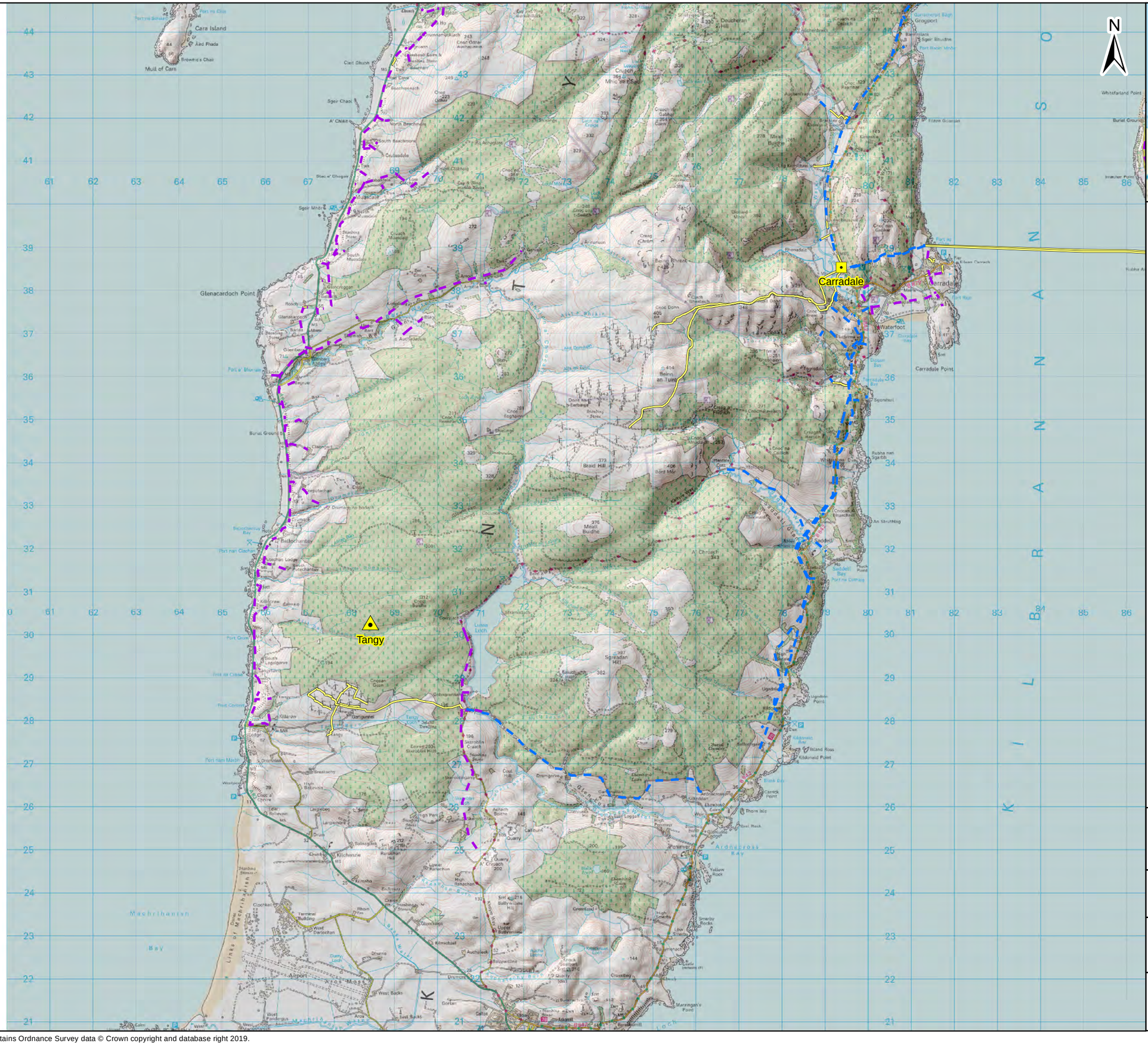
Scottish & Southern Electricity Networks

TRANSMISSION

APPENDIX 1 – FIGURES

Date Saved: 14/06/2022

Document Path: \\uk.wspgroup.com\central data\Projects\70091xx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-004 Figure 1.1 - Location.mxd



Legend

- Proposed Substation
- Existing Substation
- Existing UGC

Existing OHL

- 11 kV
- 33 kV

0 1 2 km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 1.1: Location

Date: 14 June 2022 Scale: 85,000 @ A3

Drawn: MAL Checked: IM Approved: RD

Drawing Number: TANGYIV-WSP-GIS-004

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Document Path: \\uk.wsgroup.com\central data\Projects\70091xxx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-005 Figure 3.1 - Study Area.mxd

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Legend

- Study Area
- Proposed Substation
- Existing Substation
- Existing UGC

Existing OHL

- 11 kV
- 33 kV

0 1 2 km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 3.1: Study Area

Date: 24 June 2022 Scale: 65,000 @ A3

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Drawing Number: TANGYIV-WSP-GIS-005

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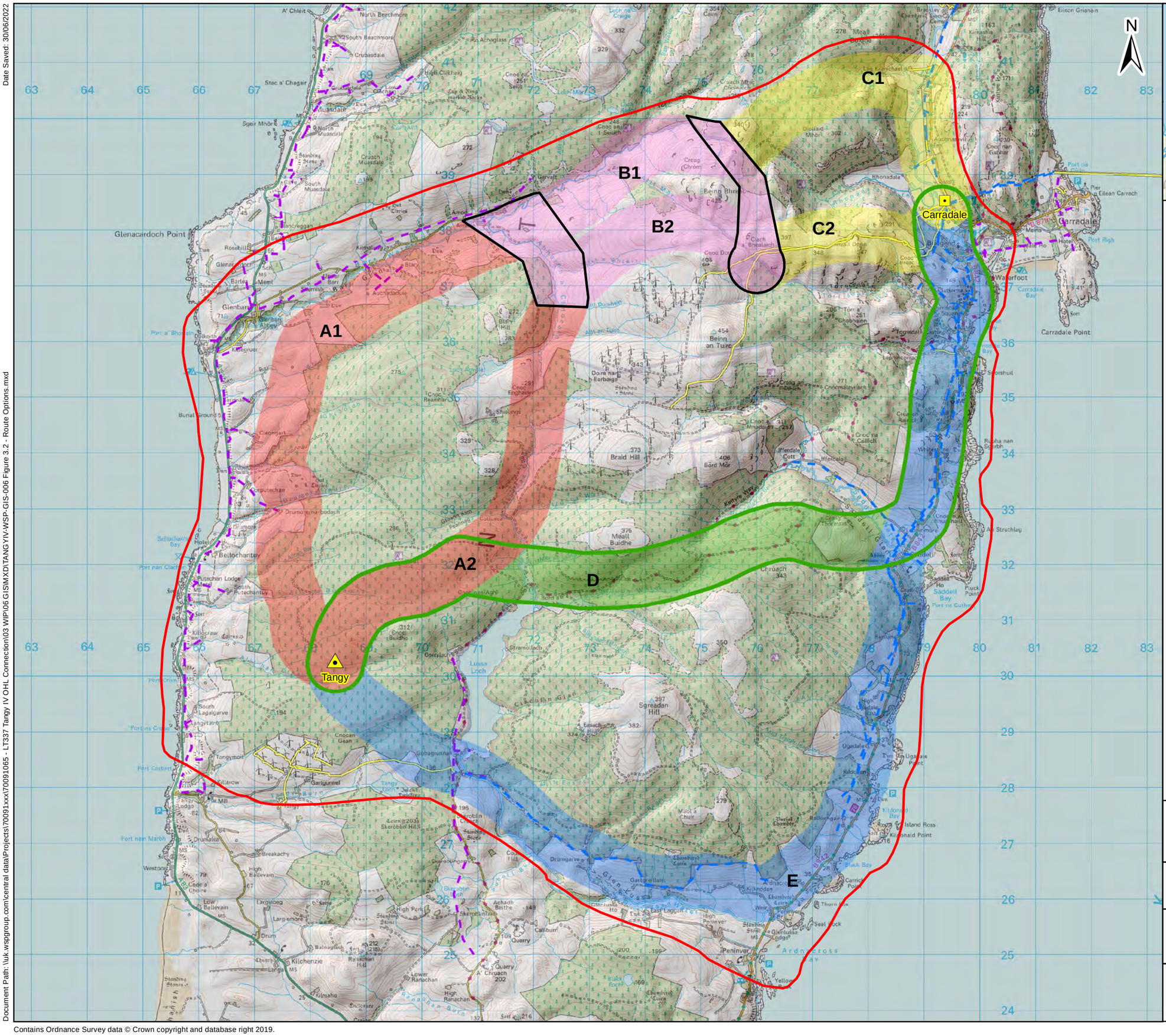
Document Path: \\uk.wspgroup.com\central data\Projects\70091xxx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-006 Figure 3.2 - Route Options.mxd



Legend

- Study Area
- Proposed Substation
- Existing Substation
- Existing UGC

Existing OHL

- 11 kV
- 33 kV

Route Options

- A
- B
- C
- D
- E

0 1 2 km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 3.2: Route Options

Date: 30 June 2022 Scale: 65,000 @ A3

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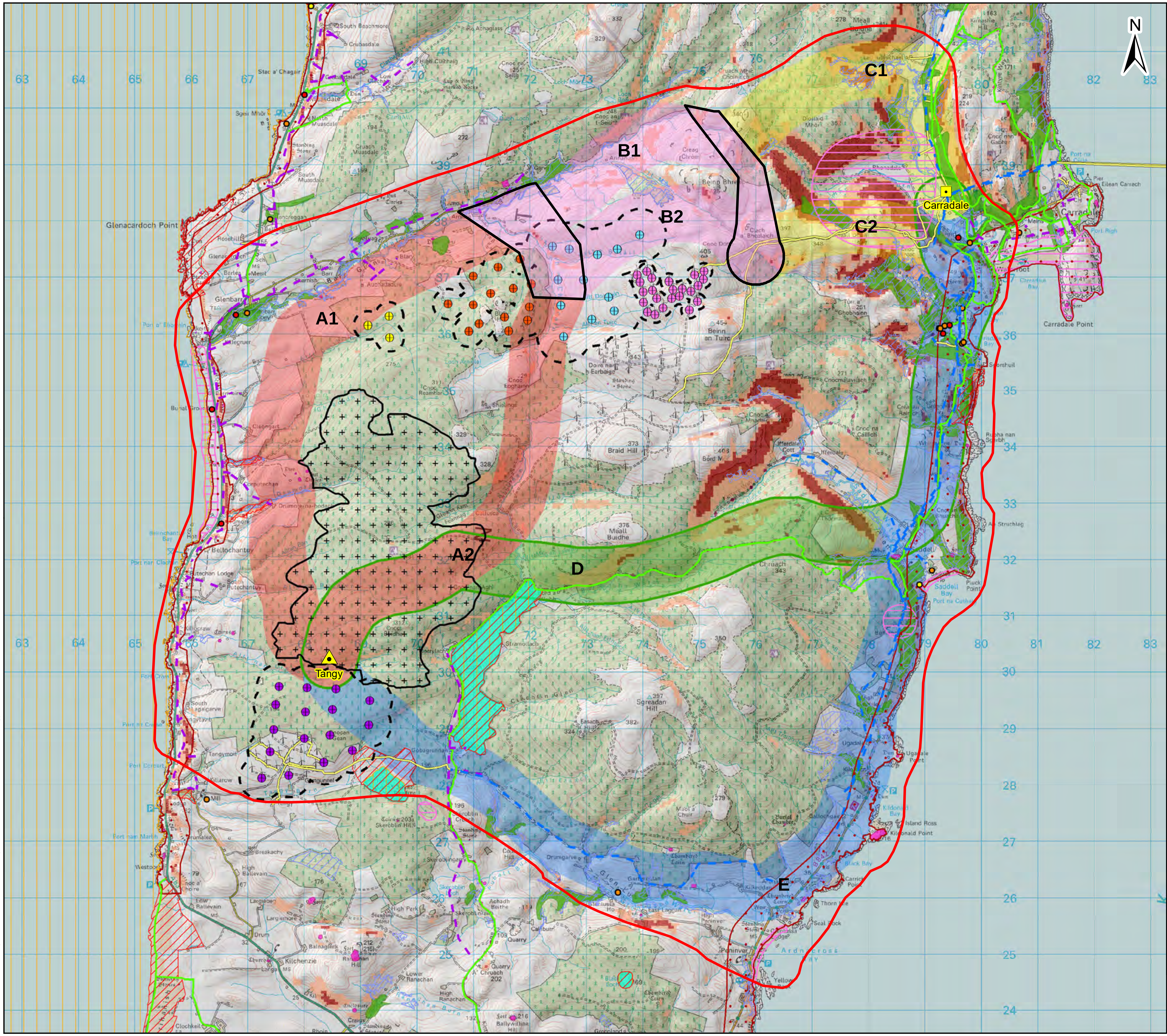

Legend

- Study
- Proposed Substation
- Existing Substation
- Existing UGC

Existing OHL

- 11 kV
- 33 kV

Turbine / Wind Farm Locations

- Arnicle
- Auchadaduie
- Beinn an Tuirc
- Blary Hill
- Tangy IV
- Cnoc Buidhe Wind Farm (turbine locations to be determined)
- Turbine buffers
  - Arnicle – 465m
  - Auchadadudie – 250m
  - Beinn an Tuirc – 145m
  - Blary Hill – 270m
  - Tangy IV – 390m

Route Options

- A
- B
- C
- D
- E
- Nodes

Listed Building Category

- A
- B
- C
- Adopted Core Paths
- Special Protection Areas
- Native Woodland Survey of Scotland
- Local Nature Conservation
- Areas of Panoramic Quality
- Site of Special Scientific Interest
- Ancient Woodland Inventory
- Ramsar Sites
- Scheduled Monuments

0 1 2 km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title

Figure 5.1: Key Constraints

Date: 7/28/2022		Scale:	65,000 @ A3
Drawn: MAL	Checked: IM	Approved:	RD
Drawing Number: TANGYIV-WSP-GIS-043			

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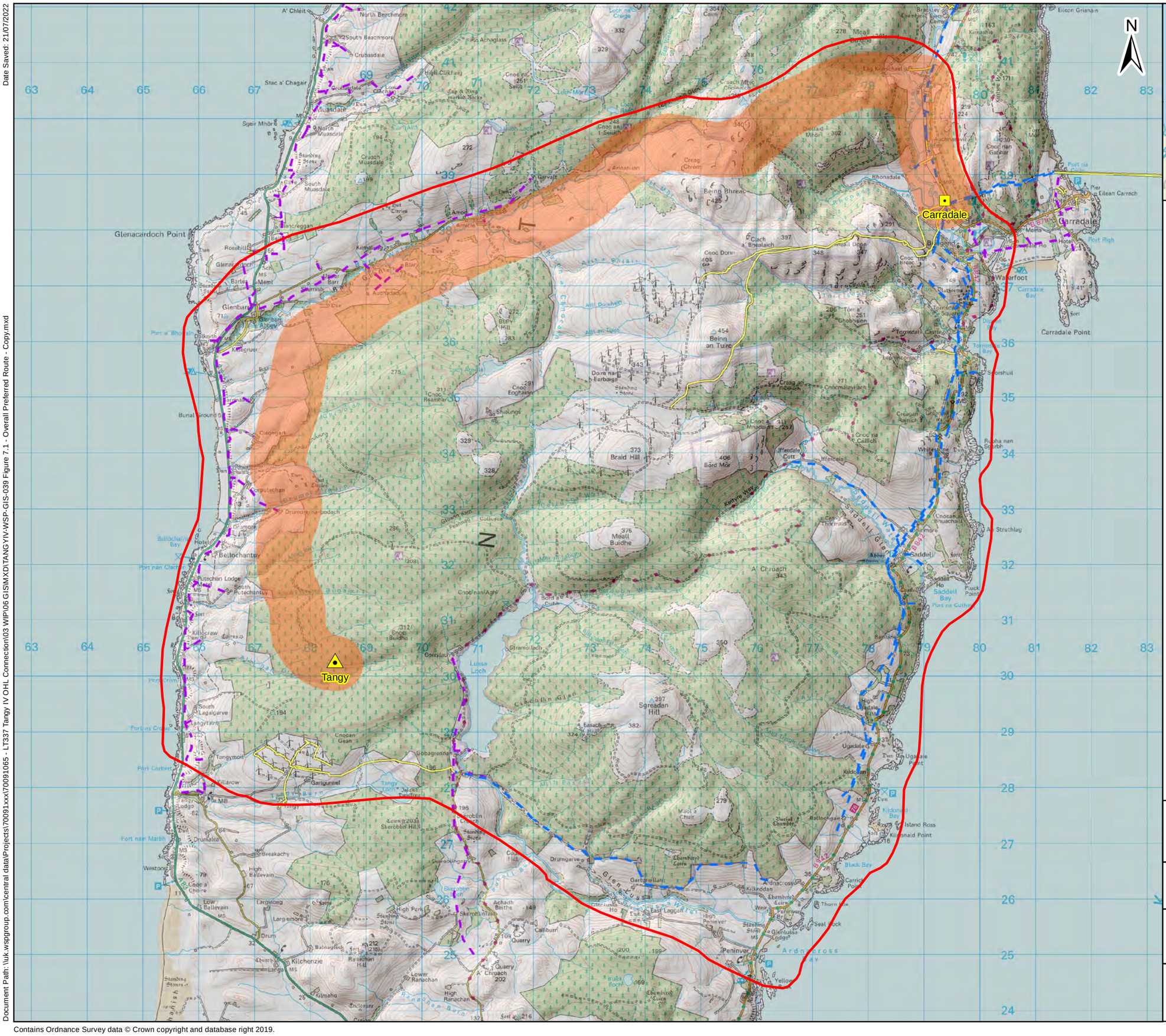
Document Path: \\uk.wspgroup.com\central data\Projects\70091xxx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-039 Figure 7.1 - Overall Preferred Route - Copy.mxd



Legend

- Study Area
- Preferred Route
- Proposed Substation
- Existing Substation
- Existing UGC

Existing OHL

- 11 kV
- 33 kV

0 1 2 km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 6.1: Preferred Route

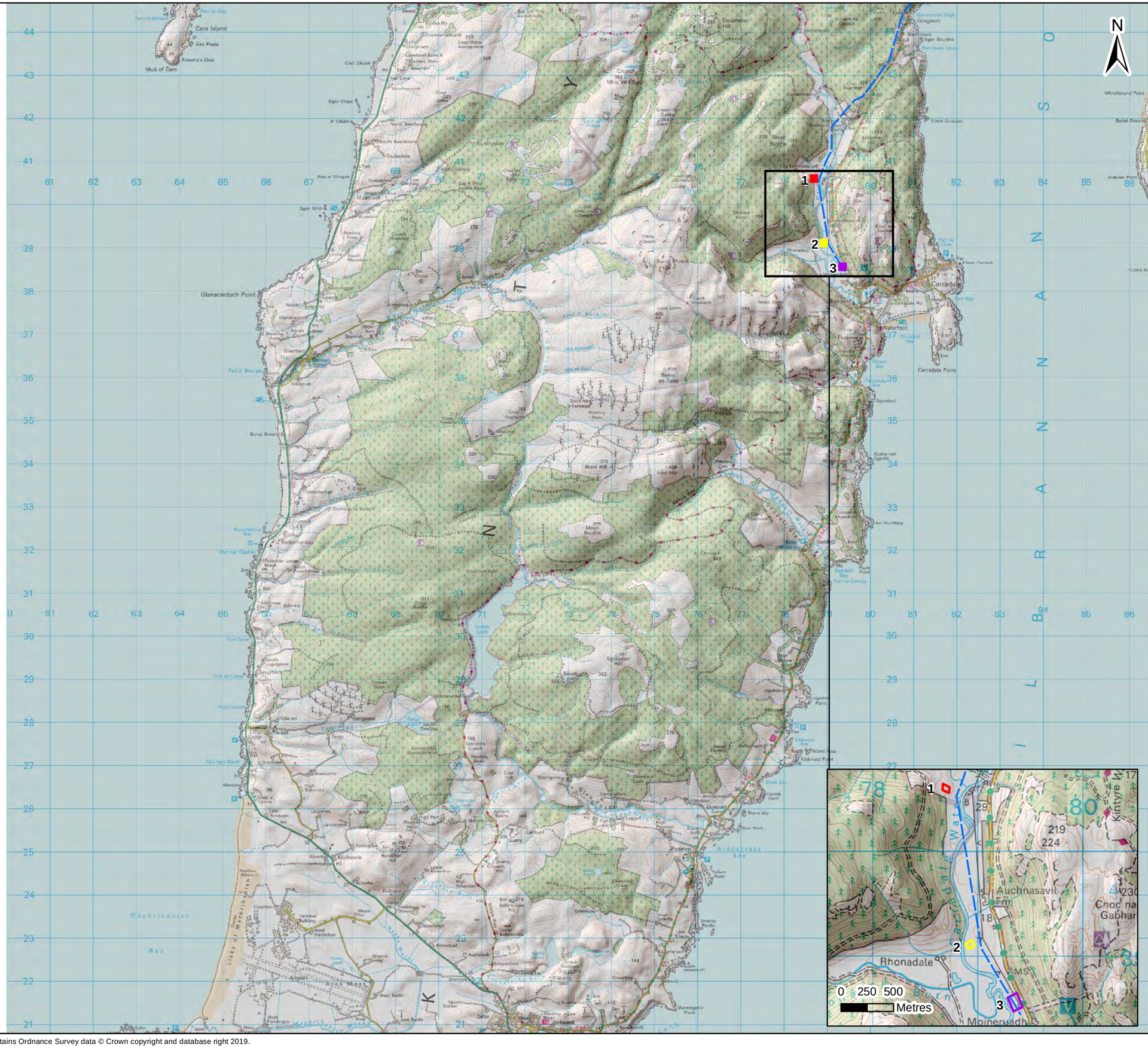
Date: 21 July 2022 Scale: 65,000 @ A3

Drawn: MAL Checked: IM Approved: RD

Drawing Number: TANGYIV-WSP-GIS-039

Date Saved: 15/07/2022

Document Path: \\uk.wspgroup.com\central data\Projects\70091xx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-033 Figure 1.1 - Location.mxd



Legend

- Crossaig - Carradale 132 kV OHL

Site Option

- 1
- 2
- 3

0 1 2 km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 7.1: Site Selection Study Location

Date: 15 July 2022 Scale: 85,000 @ A3

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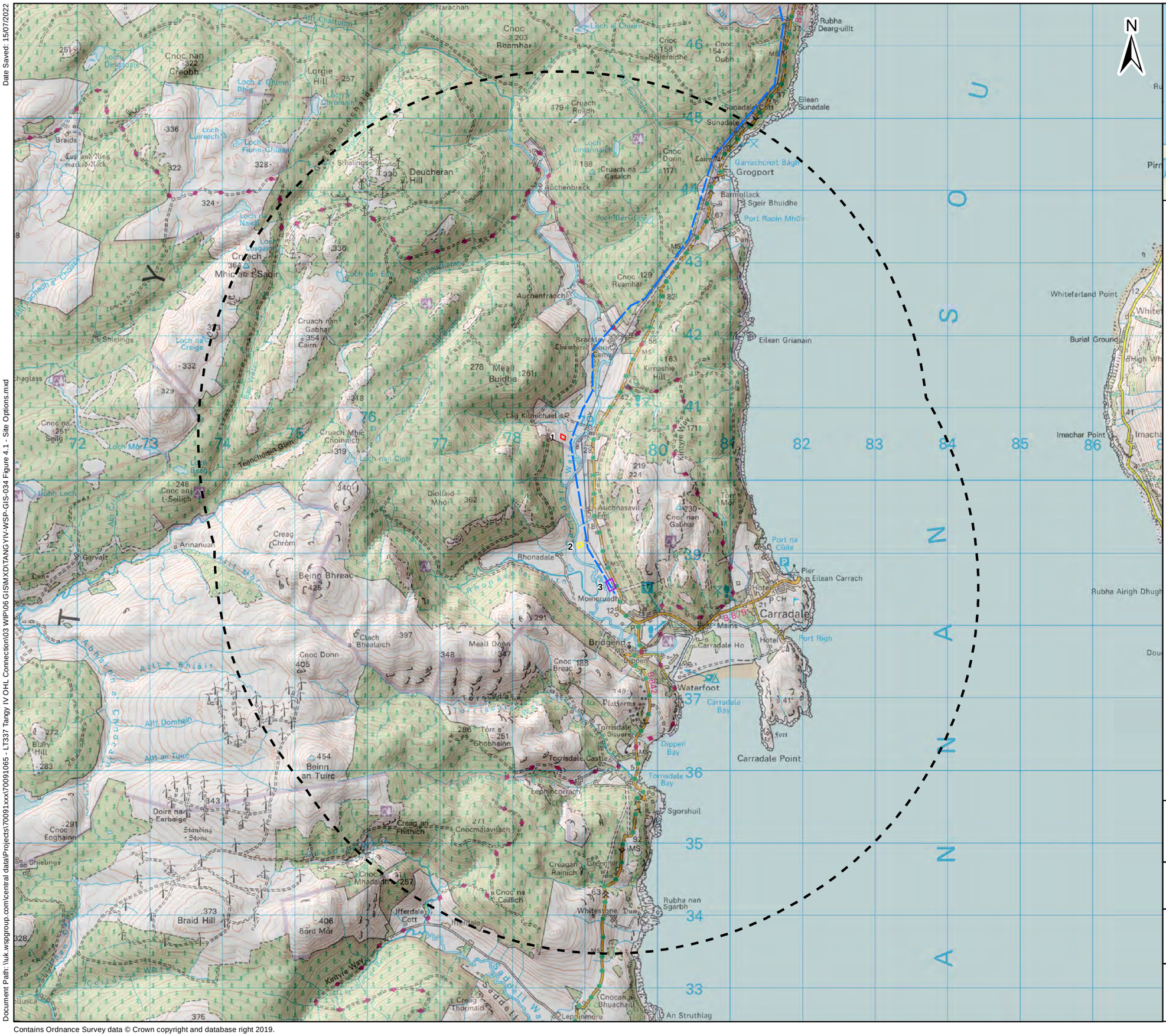
Document Path: \\uk.wspgroup.com\central data\Projects\70091xxx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-034 Figure 4.1 - Site Options.mxd



Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 7.2: Site Options

Date: 15 July 2022 Scale: 50,000 @ A3

Drawn: MAL Checked: IM Approved: RD

Drawing Number: TANGYIV-WSP-GIS-034

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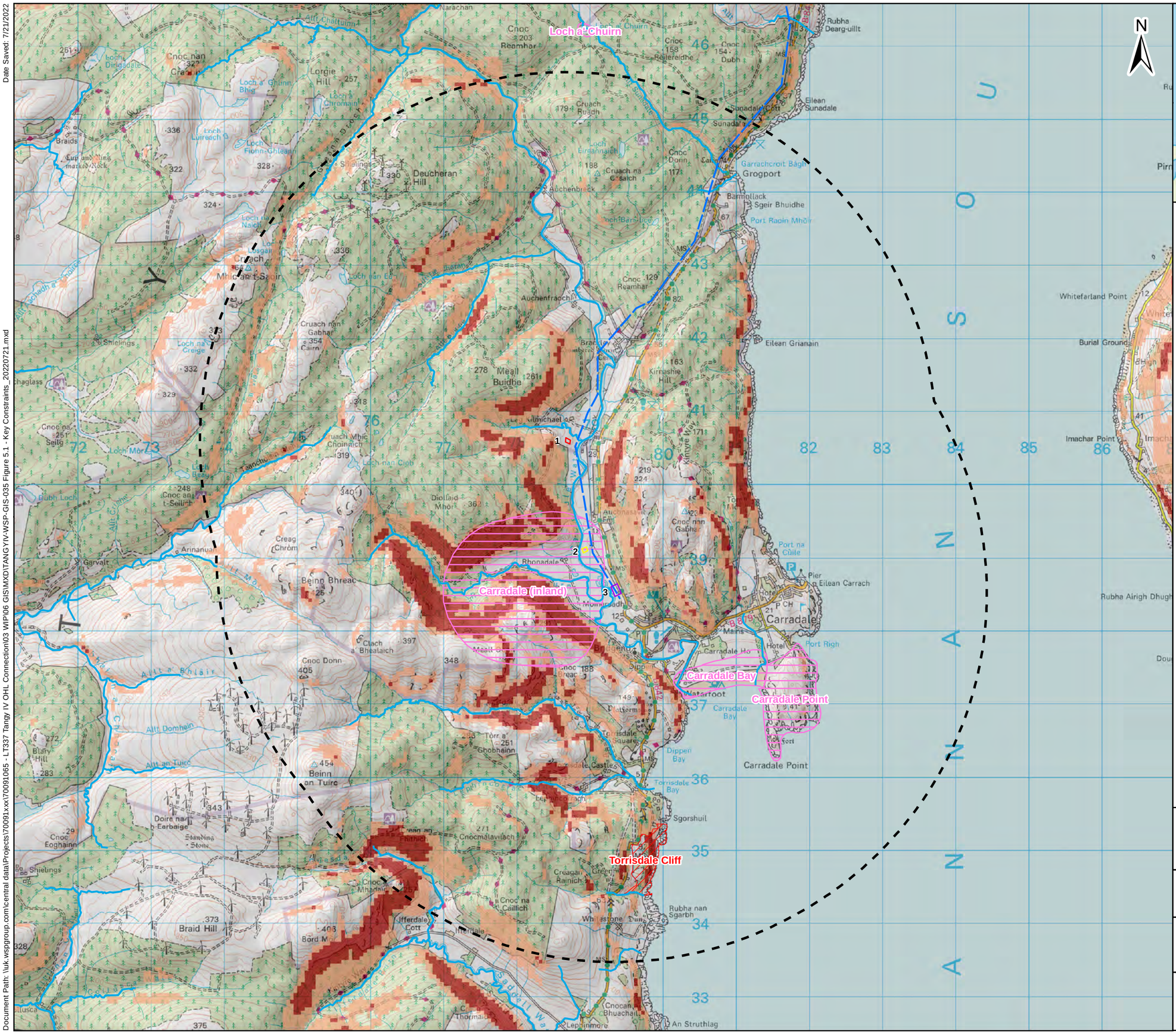

Legend

- Area of Search
- Crossaig - Carradale 132 kV OHL

Site Option

- 1
- 2
- 3

Key Constraints

- Watercourses
- Site of Special Scientific Interest
- Local Nature Conservation Site

Slope Angle

- 15° - 22°
- > 22°

0 1 2 Km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 7.3a: Site Options - Natural Heritage Constraints

Date: Thursday, July 21, 2022 Scale: 50,000 @ A3

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Drawing Number: TANGYIV-WSP-GIS-035

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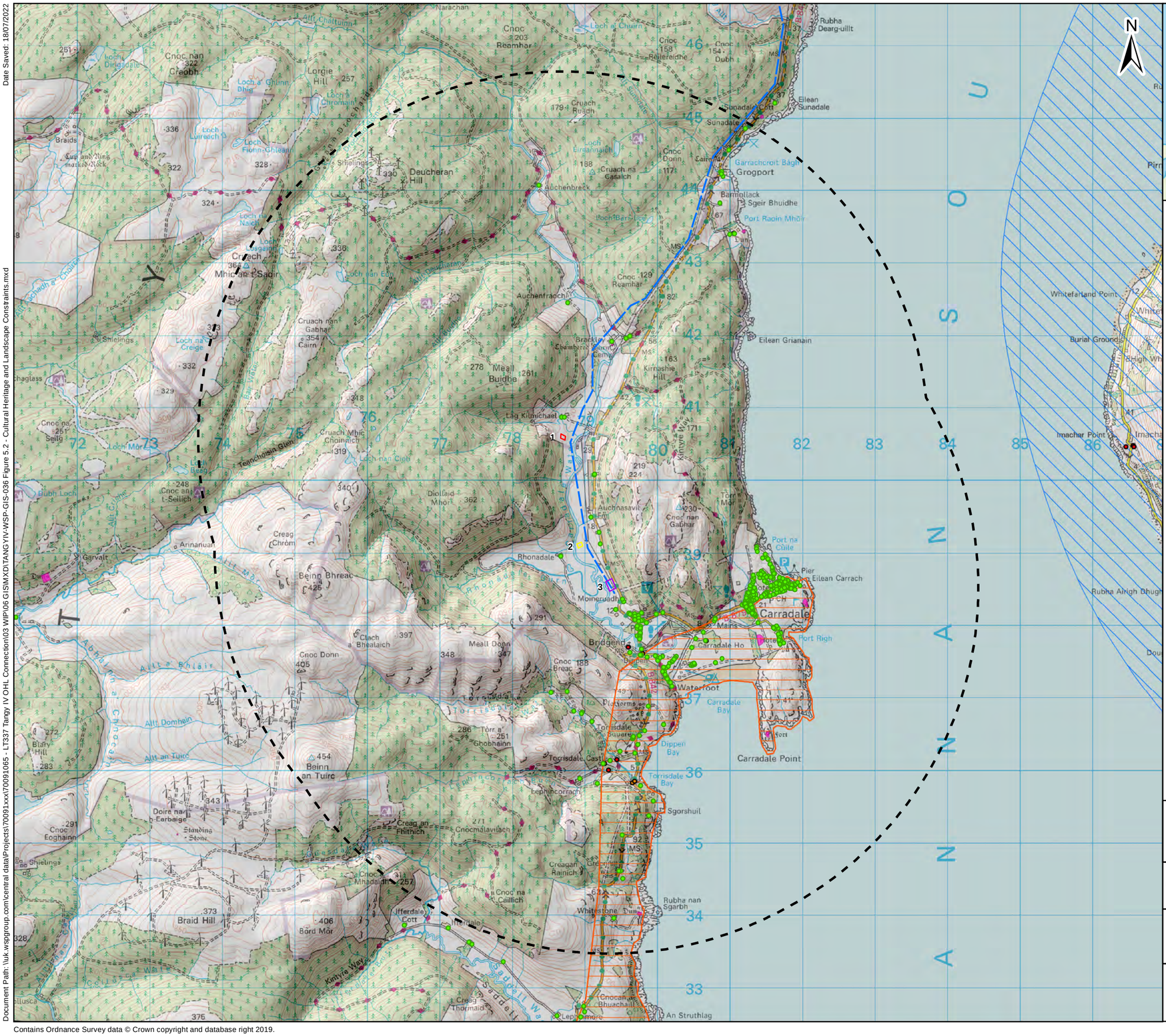
Document Path: \\uk-wspgroup.com\central data\Projects\70091xxx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-036 Figure 5.2 - Cultural Heritage and Landscape Constraints.mxd



Legend

- Area of Search
- Crossaig - Carradale 132 kV OHL

Site Option

- 1
- 2
- 3

Constraints

- Residential Dwellings
- Areas of Panoramic Quality
- National Scenic Areas
- Scheduled Monuments

Listed Building Category

- B
- C

0 1 2 Km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 7.3b: Site Options - Cultural Heritage and Landscape Constraints

Date: 18 July 2022 Scale: 50,000 @ A3

Drawn: MAL Checked: IM Approved: RD

Drawing Number: TANGYIV-WSP-GIS-036

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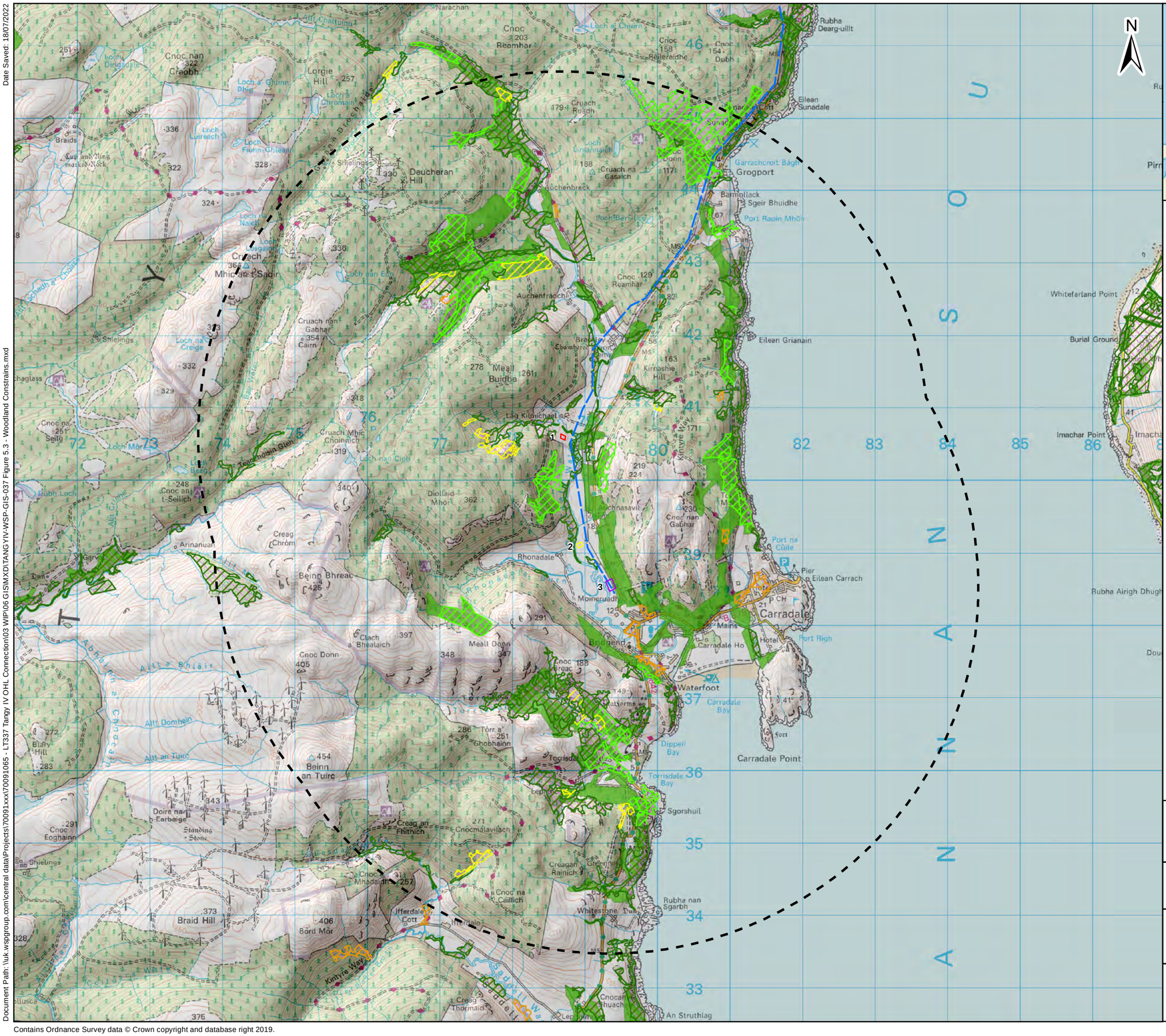

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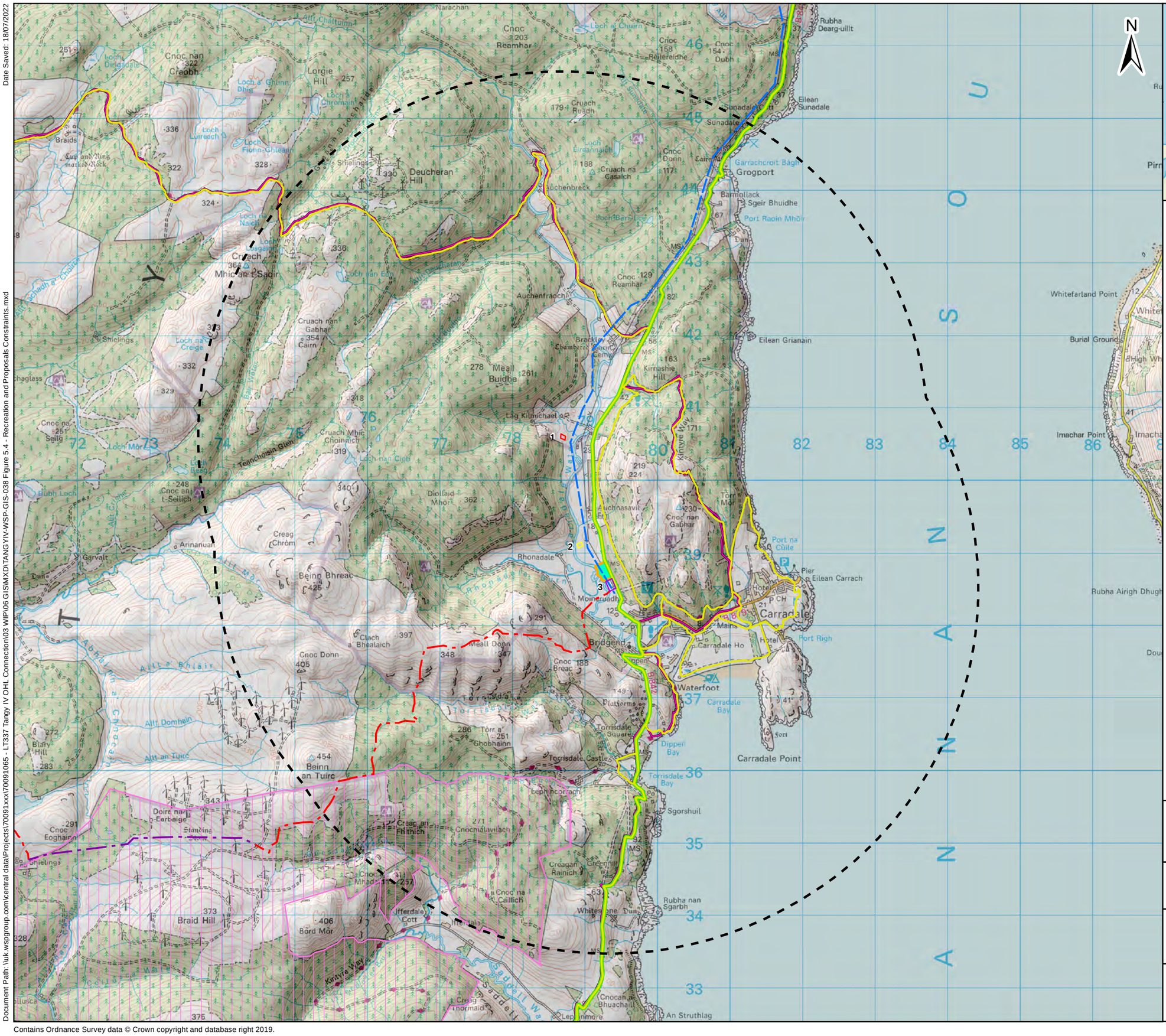
Document Path: \\uk.wspgroup.com\central data\Projects\70091xxx\70091065 - LT337 Tangy IV OHL Connection\03 WIP\06 GIS\MXD\TANGYIV-WSP-GIS-038 Figure 5.4 - Recreation and Proposals Constraints.mxd



Legend

- Area of Search
- Crossaig - Carradale 132 kV OHL

Site Option
- 1
- 2
- 3

Constraints
- Adopted Core Paths
- National Cycle Network
- Kintyre Way

Planning Application Boundaries
- 18/00034/FDP
- 21/01907/PAN
- 19/02574/S37
- UGC
- OHL

0 1 2 Km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: LT337 Tangy IV Wind Farm Connection

Title: Figure 7.3d: Site Options - Recreation and Proposals Constraints

Date: 18 July 2022 Scale: 50,000 @ A3

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Drawing Number: TANGYIV-WSP-GIS-038

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APPENDIX 2 – OHL ROUTE OPTIONS AND SITE OPTIONS SUMMARY RAG TABLES

Summary RAG Rating Table

Table A.1: Route Options Environmental, Engineering and Economic Summary RAG Ratings

Environmental Parameter		Route Options							
Main Parameter	**Sub-Parameter**	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**	**D**	**E**
Natural Heritage	Designations	H	M	H	H	H	H	H	H
	Protected Species	M	M	M	M	M	M	M	M
	Habitats	H	H	H	H	H	H	H	H
	Ornithology	M	M	M	M	M	M	H	H
	Hydrology, Geology and Hydrogeology	M	M	M	M	M	M	M	M
Cultural Heritage	Designations	H	L	M	L	M	L	M	H
	Cultural Heritage Assets	M	L	L	L	L	M	H	H
People	Proximity to Dwellings	L	L	L	L	M	M	H	H
Landscape and Visual	Designations	L	L	L	L	L	L	M	M
	Landscape Character	M	L	M	M	H	H	M	M
	Visual	M	L	L	L	M	M	H	H
Land Use	Agriculture	L	L	L	L	L	L	L	L
	Forestry	M	H	L	L	M	M	H	M
	Recreation	L	L	L	L	M	M	H	H
Planning	Policy and Proposals	M	M	L	M	L	L	M	M
Engineering Parameter		**Route Options**							
Main Parameter	**Sub-Parameter**	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**	**D**	**E**
Infrastructure Crossings	Major crossings and Metallic Pipelines	L	L	L	L	M	L	L	M
	Road crossings	H	H	M	L	H	H	H	H
Environmental Design	Elevation	L	H	H	H	H	H	H	L
	Atmospheric Pollution	L	L	L	L	L	L	L	L
	Contaminated Land	L	M	L	L	L	L	M	M
	Flooding	L	L	L	L	H	H	M	M
Ground Conditions	Terrain	L	L	M	L	M	H	M	M
	Peat	M	H	H	H	M	H	M	L
	Access	L	L	H	H	M	M	L	L

Construction/ maintenance	Windfarms	H	H	H	H	L	L	H	H
	Communication Masts	M	M	L	L	H	H	H	H
	Urban environments	L	L	L	L	L	L	L	L
Economic Parameter		**Route Options**							
Main Parameter	**Sub-Parameter**	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**	**D**	**E**
Capital	Cost	M (139%)	L	L	H (187%)	L	M (138%)	L	M (130%)
	Diversions	M	L	L	L	M	H	L	H
	Public Road Improvements	L	L	L	L	L	L	L	L
	Felling	L	H	H	L	H	L	H	M
	Land Assembly	L	L	L	L	L	L	L	L
	Consent Mitigations	H	L	M	L	L	M	L	M
Operational	Inspections	L	L	L	M	L	M	L	L
	Maintenance	L	L	L	M	L	M	L	L

Table A.2: Site Options Environmental, Engineering and Economic Summary RAG Ratings

Environmental Parameters		**Site Options**		
Main Parameter	**Sub-Parameter**	**1**	**2**	**3**
Natural Heritage	Designations	L	L	L
	Protected Species	M	M	H
	Habitats	L	L	L
	Ornithology	L	L	L
	Hydrology / Geology	M	M	M
Cultural Heritage	Designations	L	L	M
	Cultural Heritage Assets	L	L	L
Landscape and Visual	Designations	L	L	L
	Landscape Character	M	M	L
	Visual	M	M	L
Land Use	Agriculture	L	L	L
	Woodland / Forestry	L	L	L
	Recreation	M	M	M
Planning	Policy	M	M	M
	Proposals	L	L	M
Engineering Parameters		**Site Options**		
Main Parameter	**Sub-Parameter**	**1**	**2**	**3**
Connectivity	Existing circuits / network	L	M	M
	Future development possibilities	H	H	M

	Interface with SSE Distribution and Generation	L	L	L
	DNO Connection	L	L	L
Footprint Requirements	Technology	L	L	L
	Adjacent Land Use	L	M	L
	Space Availability	L	H	L
Hazards	Unique Hazards	L	H	L
	Existing Utilities	M	M	M
Ground Conditions	Topography	L	L	L
	Geology	L	M	M
Environmental Conditions	Elevation	L	L	L
	Salt Pollution	H	H	H
	Flooding	M	H	H
	Carbon Footprint	H	H	L
	SF6	L	L	L
	Contaminated Land	L	L	L
	Noise (proximity to dwellings / residential properties)	L	L	L
Construction Access	Substation Access Road (from public roads)	M	M	L
Operation and Maintenance	Access	L	L	L
Cost Parameters		**Site Options**		
Main Parameter	**Sub-Parameter**	**1**	**2**	**3**
Capital	Construction	H (185%)	H (185%)	L
	Diversions	L	L	L
	Public Road Improvements	L	L	L
	Felling	L	L	L
	Land Assembly	H	H	L
	Consent Mitigations	H	H	L
Operational	Inspections	L	L	L
	Maintenance	L	L	L