ESB International
ESBI Energy Innovation

EIRGRID

Project Title:	**Clashavoon – Dunmanway 110kV Project**
Report Title:	**Phase 1 - Lead Consultants Corridor Identification Report**
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Part A Project Overview

Chapter 1 – Introduction

1.1 The Purpose of this Report

A new 110kV circuit is required by EirGrid to connect the existing 220/110kV substation at Clashavoon (approximately 5km north-east of Macroom, Co. Cork) to the existing 110kV substation at Dunmanway Co. Cork.

The aim of this Phase One Lead Consultant's Report is to present what is currently considered by ESB International (EirGrid's Lead Consultant) to be the emerging preferred corridor within which to site the proposed new circuit.

It is intended that the information herein will enable meaningful consultation between the project team and all interested parties, including members of the public.

This report sets out to:

- present the need for the project
- establish a study area for the project
- identify environmental and other constraints within the defined study area
- identify potential route corridor options for the project within the defined study area
- evaluate the various corridor options, having regard to environmental and engineering constraints
- identify an emerging preferred corridor for the project within which to route the proposed 110 kV circuit.

1.2 About EirGrid

EirGrid plc is the statutory operator of Ireland's national electricity grid (also called the 'Transmission System'). EirGrid is an independent, state-owned company.

EirGrid has several roles;

- To operate a safe, reliable, economical and efficient national electricity grid.

- To plan and develop the grid infrastructure needed to support Ireland's economy.
- To supervise the security of the national grid.
- To schedule electricity generation with power generators and stations.
- To facilitate the market for renewable electricity in Ireland.

It is in this capacity that EirGrid is proposing the Clashavoon - Dunmanway 110kV electrical reinforcement.

1.3 Strategic Planning Context

1.3.1 Government Objectives

White Paper on Energy Policy Framework 2007-2020

The White Paper sets out the government's Energy policy framework 2007-2020 to deliver a sustainable energy future for Ireland.

Strategic Goals outlined in the White Paper in relation to security of energy supply include:

• Ensuring that electricity supply consistently meets demand;

• Delivering electricity and gas to homes and businesses over efficient, reliable and secure networks;

and

• Being prepared for energy supply disruptions.

The Irish government has set ambitious targets for Renewable Energy Sources (RES) which are: 15% of electricity supply by the end of 2010 and 40% by 2020. The South West region of Ireland in particular has been identified as having an abundance of renewable sources to meet these renewable energy targets.

GRID25 – A Strategy for the Development of Ireland's Electricity Grid for a Sustainable and Competitive Future (2008) outlines EirGrid's high level strategy for upgrading Ireland's electricity network up to 2025, in response to the government White Paper. As outlined in the document, demand in the South West region is expected to rise by 60% by 2025, including up to 880 MW of wind

generation and up to 40 MW of ocean generation in the Cork city and county area.

National Development Plan 2007-2013

The National Development Plan 2007-2013 sets out to ensure that Ireland remained competitive in the global international marketplace and that the fruits of our economic success would be shared more equally at regional level and throughout our society. A strategic objective of the Energy Programme of the NDP is to ensure security of supply nationally and regionally. The NDP further states, that the main focus of investment by EirGrid *'will entail improvement of the transmission network for electricity to accommodate increased usage and enhance security of supply, to allow increased connection of sustainable and renewable energy sources to the network and to support greater interconnection with Northern Ireland and Great Britain'*.

It is considered that the objectives of the NDP remain entirely valid, despite the current economic downturn.

National Spatial Strategy 2002-2020

The NSS is a 20 year Spatial Planning Strategy, which is a strategic vision for the spatial development of Ireland. It outlines how a strengthened network of cities and towns together with rural communities and their resources will be mobilised and complemented by appropriate social and physical infrastructure, to create more balanced development across the country.

In relation to key infrastructure projects, the NSS identifies that 'a feature of the most mature and successful economies is that they possess highly developed, well integrated infrastructure that supports movement, i.e. public and private transport, and energy and communications networks.'

1.3.2 Regional Objectives

Regional Planning Guidelines for the South West Region 2004-2016

The objective of the Regional Planning Guidelines is to provide a long-term strategic planning framework, for the development of the South West Region

over a 20 year period. The planning framework sets the scene for the implementation of the National Spatial Strategy at a regional level, and contains strategic policy directions which will cross the boundaries of the individual counties, and will later be incorporated into the policies of the county and other Development Plans of the Region.

The National Spatial Strategy has identified reliable and effective energy systems such as gas and electricity to power industry and services as prerequisites for effective regional development. Prime considerations relevant to the South West Region are 'the provision of a quality energy and electricity network is critical to the regions development.'

Draft Regional Planning Guidelines for the South West Region 2010- 2022

Draft Regional Planning Guidelines were published on 2nd March 2010. Chapter 5 of the draft Guidelines considers Transport and Infrastructure. Section 5.6.24 notes that *'A White Paper sets out the Government's Energy Policy Framework 2007-2020 to deliver a sustainable energy future for Ireland. The document emphasises the fact that security of energy supply is crucial for the economy and society and that the country needs robust electricity networks and electricity generating capacity to ensure consistent supply to consumers and all sectors of the economy'*. In addition it notes *'This national grid development, which is supported by the Regional Planning Guidelines, will include the upgrading of the transmission network and new transmission developments and strengthening of the Cork network to allow power to be exported from the two gas fired generators in East Cork'*.

The proposed reinforcement of the electricity supply between Clashavoon and Dunmanway is therefore supported and planned for at a regional level.

Cork County Development Plan 2009-2015

The County Development Plan for Cork was adopted in January 2009. Chapter 6 of the CDP considers Transport and Infrastructure. Within this chapter there are specific objectives relating to energy networks, renewable energy, wind energy, bio energy, energy transmission and power lines.

Objective INF 7-1(a) states 'It is an objective to recognise the national importance of ensuring security of energy supplies for servicing a whole range of economic sectors in line with the Government's White Paper 'Delivering a Sustainable Energy Future for Ireland'.

The proposed reinforcement of the electricity supply between Clashavoon and Dunmanway is therefore supported and planned for at a County level.

1.4 EirGrid Policy on Underground Cables

EirGrid has the exclusive statutory function to operate, maintain and develop a safe, secure, reliable economic and efficient electricity system in Ireland, while having due regard for the environment in carrying out this exclusive function. EirGrid has established policies and practices for the construction & operation of high voltage overhead lines and underground cables in Ireland. Whenever a new high voltage circuit is proposed, this policy guides the decision on whether to use overhead line or underground cable.

EirGrid policy confirms that an underground cable will only be used if all of the following four conditions apply-

1. An overhead line is not environmentally feasible;
2. A technically and environmentally acceptable route for underground cable can be found;
3. The effect that the electrical characteristics of underground cable have on the transmission network is acceptable, and the relative 'availability' of the underground cable is tolerable; and;
4. The relative greater cost of the underground cable above that for overhead line can be justified;

In relation to condition (1) above, Chapters 3 & 4 of this report confirms that there are three number environmentally feasible corridors, within which to route a 110kV overhead line circuit, and that the predicted environmental impacts of such overhead development are sustainable. Therefore EirGrid must propose an overhead line solution for this project. As such condition (1) does not apply. Notwithstanding this, the use of underground cable has been considered for this project.

In relation to condition (2) above, EirGrid commissioned ESB International to carry out a feasibility study to investigate underground cable route options and environmental studies to assess the impact of installing underground cable on these routes. Technically feasible cable route options were identified and the environmental impacts are sustainable. As such condition (2) does apply.

In relation to condition (3) above, a project specific 110kV technical screening study has examined the electrical characteristics of using a cable for the proposed circuit. The electrical characteristics of cable are deemed tolerable based on the 110kV technical screening study.

The reliability of both the overhead line and underground cable has been assessed based on a combination of fault data from the Irish transmission system and CIGRE (The international council on large Electric Systems) data on 110kV faults. Over the lifetime of the proposed circuit, the overhead line has a better reliability and a significantly better repair time of faults. Therefore, it follows that the overhead line will provide a better availability than underground cables.

In relation to condition (4) above, EirGrid has estimated the costs associated with an overhead line and underground cable solution. Based on the emerging preferred overhead line corridor and the emerging preferred underground cable route, it is estimated that, the underground cable would cost approximately 100% more than the overhead line. As such the relative high cost of an underground cable cannot be justified for this project. As such condition (4) does not apply.

In summary, EirGrid's policy on the use of high voltage underground cable and overhead line in Ireland states, that all four of EirGrid's conditions must apply for an underground cable to be used within a proposed circuit.

As a number of these conditions do not apply EirGrid is proposing an overhead line solution for this project.

1.5 Project Description

The proposed Clashavoon – Dunmanway circuit will consist of an overhead line operating at 110kV between the existing Clashavoon 220kV station and the existing Dunmanway 110kV station, both in Co. Cork. Associated development includes a new line bay in each of the existing stations. The overhead line will be

constructed predominantly of double wood polesets supporting three electrical conductors and two earthwires. Angle structures are used only where the line changes direction. Depending on the degree of the line angle either a braced wood poleset or a steel angle mast will be used. Planning drawings for the structures to be used on this project are contained in Appendix I.

1.5.1 Structure Description

1.5.1.1 Overhead Line Intermediate Wood Polesets

Overhead line intermediate wood polesets consist of two wood poles, 5 metres apart connected near the top with a rolled steel channel. The wood poles are typically 16 to 23 metres in height, depending on the ground profile. A minimum of 2.3 metres of this pole length will be buried underground. The polesets carry three conductors (1circuit) suspended from electrical insulators and two earthwires which are supported at the tops of the poles on earthwire brackets which protrude 0.45m above the top of the pole (as illustrated below in Figure 1).

Figure 1 is an outline of a typical double wood poleset and Figure 2 is a photograph of the existing Dunmanway-Macroom 110kV line giving a perspective on how the final, fully constructed overhead line poleset will look. This photograph is of the existing Dunmanway – Macroom 110kV Line close to Dunmanway 110kV Station.

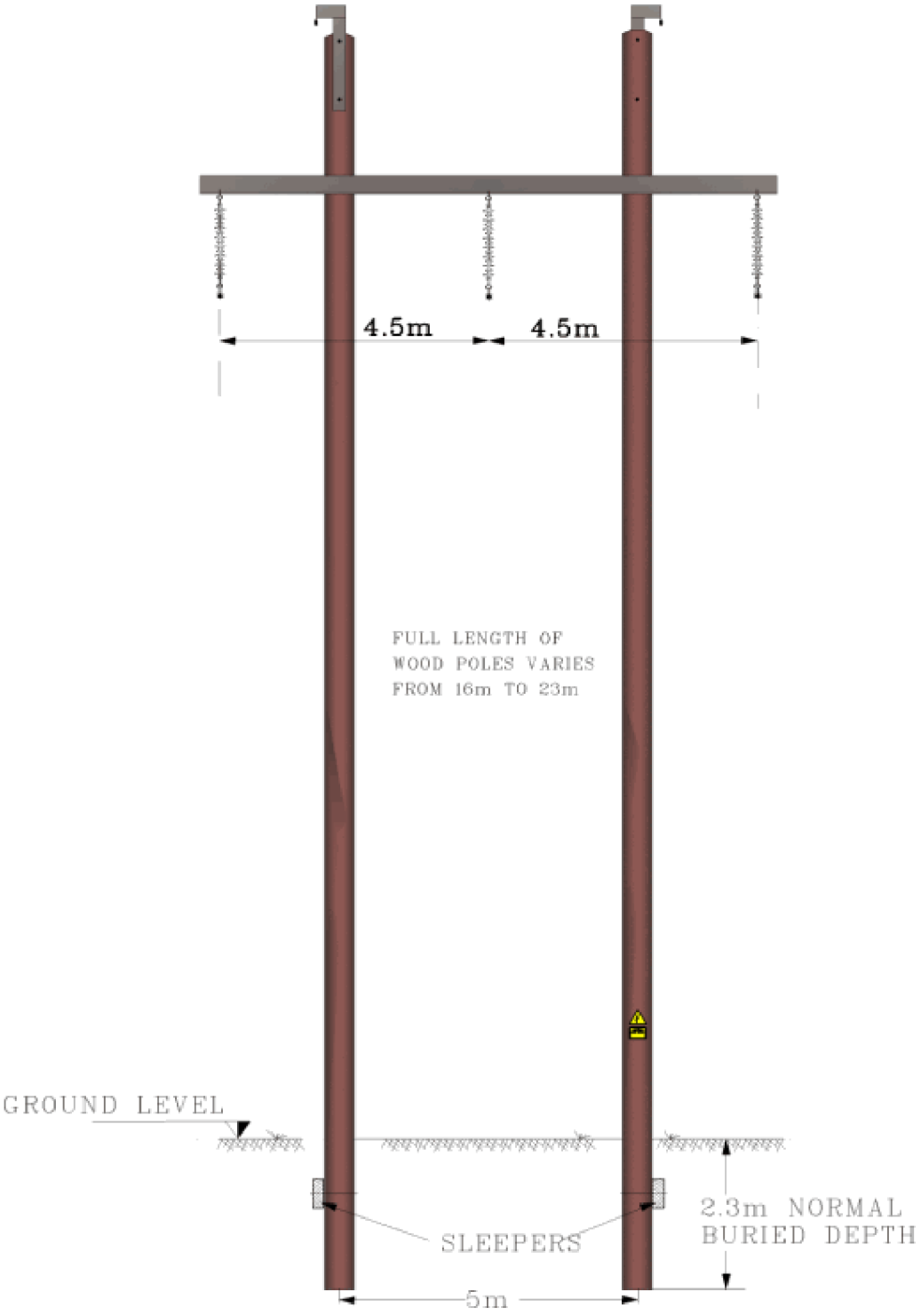


Figure 1: Outline of typical earthwire poleset structure

Figure 2: A picture of the earthwire section of the existing Dunmanway-Macroom 110kV Line close to Dunmanway 110kV Station.

1.5.1.2 Overhead Line Single Circuit Angle Structures

Braced poleset (less than 20degree line angle)

Braced polesets look similar to those describe in section 1.5.1.1 however the poleset is braced (for extra strength) along its centre and on the earthwire section using steel channels. See Figure 3 on the following page.

Figure 3: Outline of typical earthwire braced poleset structure

1.5.1.3 Steel angle tower

Steel angle towers are galvanised lattice steel structures used wherever the overhead line changes direction. They range in height from 18 to 24 meters depending on the ground profile. The angle structure holds three conductors, connected to electrical insulators in horizontal formation to its bottom crossarm. Two earthwires are supported on the earthwire peak of the mast (as illustrated in Figure 4). Figure 5 gives an in situ perspective on how the final fully constructed overhead line will look.

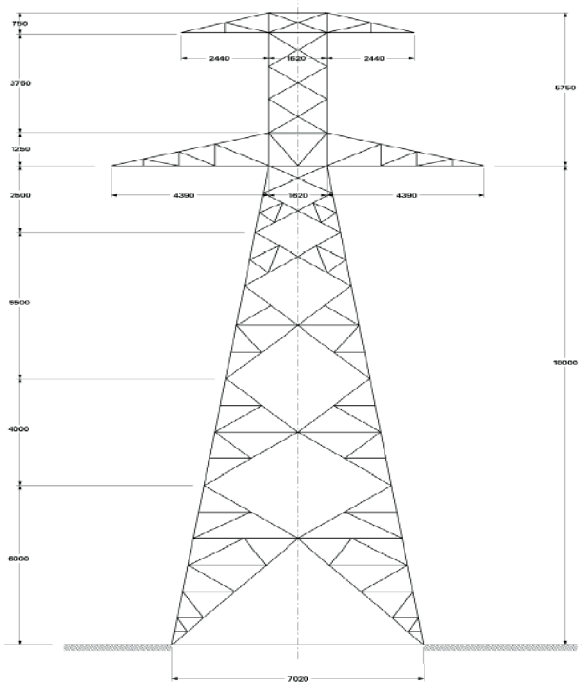


Figure 4: Typical earthwire steel angle structure

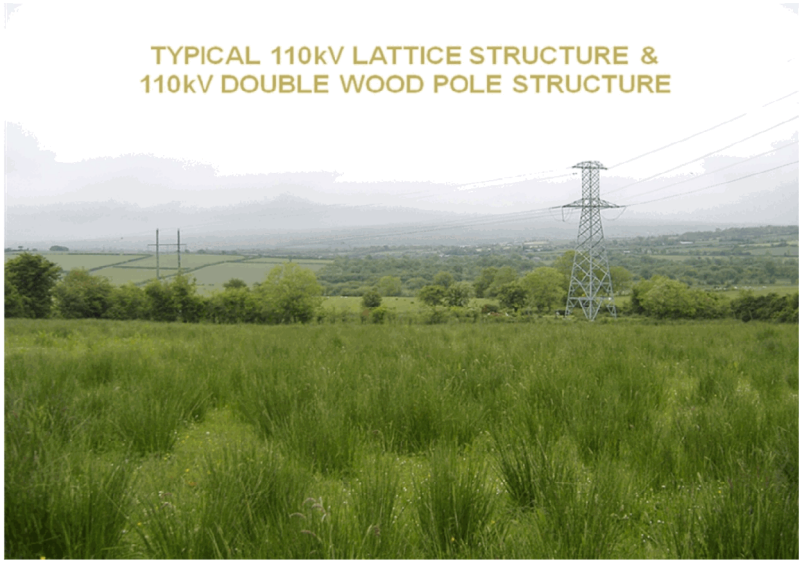


Figure 5: Typical 110kV earthwire angle structure

1.5.1.4 Station Structures

Additional line bays are required in both existing Clashavoon and Dunmanway 110kV stations. This is the termination point of the overhead line. Figure 6 below shows a typical station layout.

Figure 6: Typical station layout

1.6 Project Justification

To assist with understanding the justification for the project, Figure 7 below illustrates the transmission network in South West Cork. In particular, this figure indicates the two existing transmission stations which need to be connected by the proposed reinforcement, in order to achieve the optimum reinforcement for this area.

The two-fold justification for the project is summarised as:-

1) Security of electricity supply

Currently the electricity supply in South West Cork is maintained by two 110kV transmission lines: the Dunmanway – Macroom 110kV line and the Bandon – Raffeen 110kV line. During routine maintenance of either line, the subsequent unplanned loss of the other line would mean that South West Cork would lose its electricity supply, and would leave South West Cork, including the towns of Bandon, Bantry and Dunmanway and extended areas around them, without power.

2) Connection of renewable generation

There is a significant amount of renewable generation connected or seeking to connect in South West Cork, consistent with government energy policy. The current transmission network configuration and capacity is not capable of accommodating the connection of this amount of renewable generation.

Figure 7: Southern Region Transmission Network

The project first received capital approval (financial go-ahead within EirGrid) in September 2006. Prior to this, in the pre-capital approval phase, a high level feasibility report was commissioned by EirGrid and concluded that feasible routes for this circuit were available. A pre-application meeting was held with An Bord Pleanála in August 2007 to determine if the project should be deemed strategic under the Planning and Development (Strategic Infrastructure) Act 2006. Indicative route corridors were shown to An Bord Pleanála in August 2007 based on the feasibility study completed in the pre-capital approval phase. The meeting concluded that the preliminary view of the board was that the project was strategic.

In December 2008, EirGrid advised An Bord Pleanála that the project had been put on hold. This was as a result of the change in the broader economic conditions within the Republic of Ireland, which prompted a review of the need for

the project. Furthermore, the connection process for the next tranche of renewable generation connections was at a critical stage, where a decision from the Commission for Energy Regulation (CER) was pending, which could also directly impact upon the need for the project.

EirGrid completed a review of the project justification factoring both changes outlined above and confirmed the need for the project.

1.6.1 Alternatives Considered

A number of alternative reinforcement options have been considered during the lifetime of this project. These alternatives are detailed below

- *Clashavoon - Dunmanway 220kV*

This option would provide the necessary technical solution, but would result in a significant amount of capacity that would not be utilised in the foreseeable future. It was considered that this would comprise an inefficient use of capital, and therefore this option was not considered further.

- *Second Clashavoon-Macroom 110kV circuit in combination with various additional 110 kV circuits*

Various 110kV reinforcements in combination with a second Clashavoon – Macroom 110kV circuit were considered, comprising:-

Dunmanway – Macroom 110kV line

Bandon - Macroom 110kV line

Bandon - Raffeen 110kV line

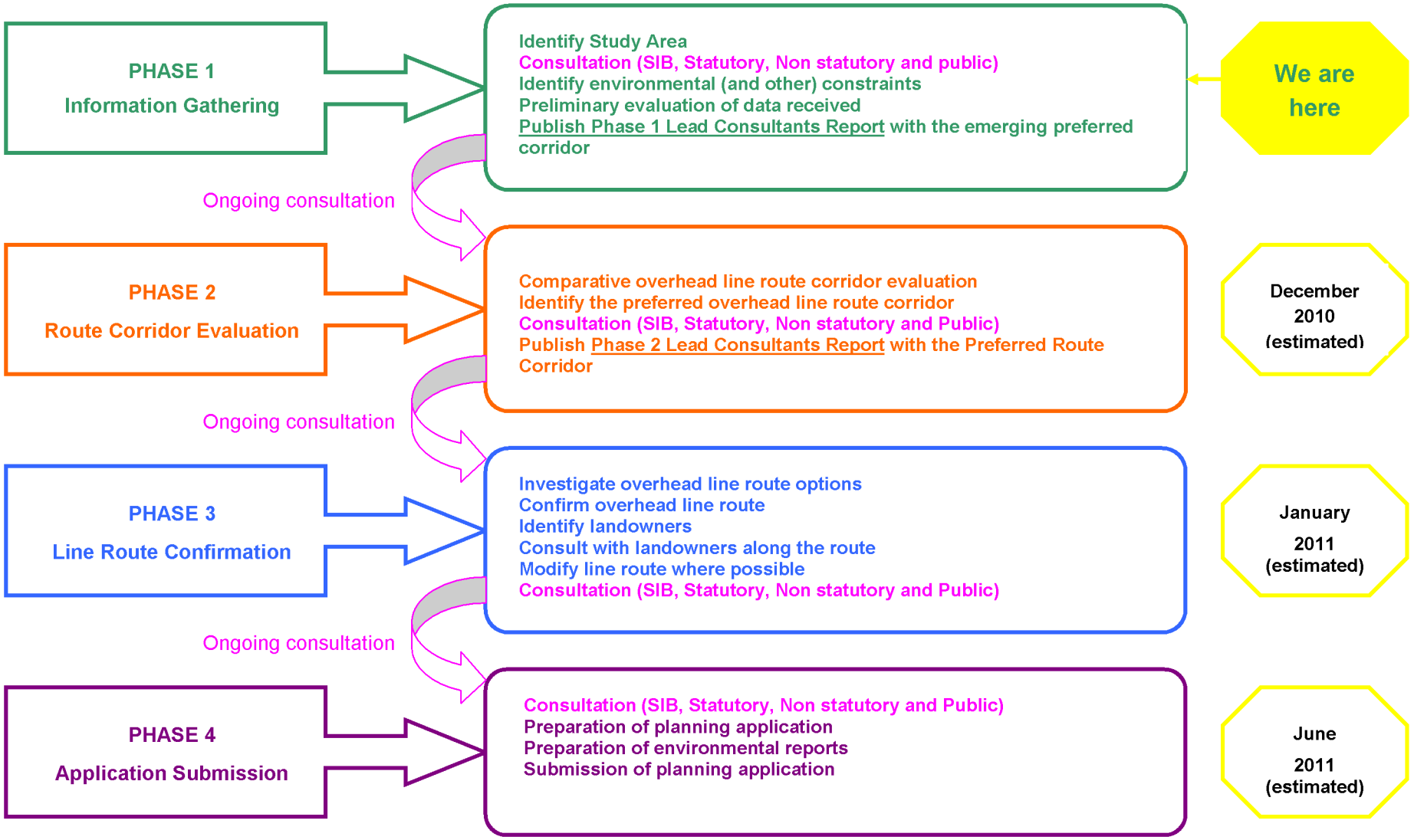
Bandon – Coolroe 110kV line

These options were all found not to provide the long-term solution required for the area that resolved both the identified issues of security of supply and the facilitation of renewable generation.

In addition, a 110kV circuit between stations at Ballylickey and Glanlee was assessed as an alternative to a Clashavoon – Dunmanway 110kV circuit. This option is not technically feasible, as the Glanlee 110kV substation is used as a collection point for renewable generation. The 110kV electricity network connecting Glanlee 110kV station will be used to direct the power generated here

to the higher capacity 220kV network in the area. In the event of an outage of the Glanlee connection to the 220kV network, a Ballylickey-Glanlee circuit would provide an alternative path for this renewable generation which could, however, overload the 110kV network in South West Cork.

1.7 Project Roadmap



1.8 Project Team

ESB International has been appointed by EirGrid as lead consultant for the project .

AOS Planning has been appointed to produce specialist inputs for environmental reports.

1.9 Safety

ESB International has been appointed as Project Supervisor Design Process (PSDP) for the project and will fulfil all duties as defined by the Safety, Health and Welfare at Work (Construction) Regulations 2006 (S.I. No. 504 of 2006). In this capacity ESB International will coordinate the work of all designers to ensure the proposed development submitted to An Bord Pleanála is designed to be constructed and operated to be fit for purpose and in line with best international practice.

On completion of the project ESB International will hand over to the client all legislatively required safety documentation.

Chapter 2 – Study Area and Constraints Identification

2.1 Study Area Identification and description

A study area was selected as the broad geographical area within which it is considered potential route corridors can best occur to meet the justification for the project, as outlined above. The project study area is approximately 560km^2 in area (20km x 28km). Figure 8 shows the study area.

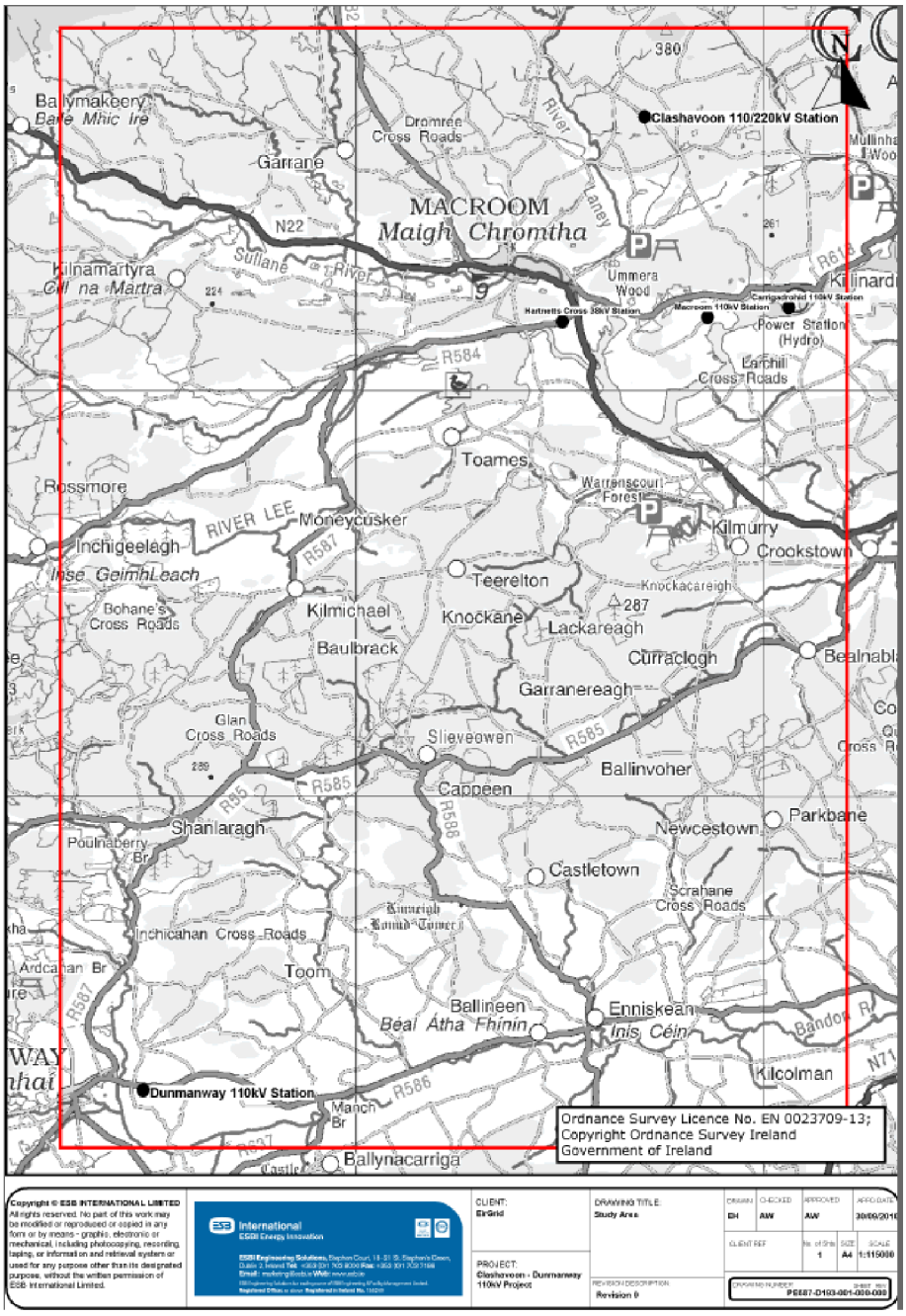


Figure 8: Study Area

The area is rich in environmental, ecological and historical sites. It includes The Gearagh or wooded river, a natural nature reserve. This is an area of alluvial forest which was formed in the basin of the River Lee at the end of the ice age. The area has been designated as a nature reserve and the water levels are controlled by the hydro-electric dam at Carrigadrohid.

There are also a number of historical sites in the area; these include Carrigaphooca Castle, Macroom Castle, Crowley Castle and the MacCarthy Castles.

There are two main towns in the area - Macroom and Dunmanway. Macroom is located approximately 38km from Cork City on the N22. The town has been described as one of the key gateways to the tourist region of west Cork. The 2006 census records the population of the town at 3,553.

Dunmanway is located approximately 63km west of Cork City on the R586. The town is built around two rivers, each of which is a tributary of the larger River Bandon, which passes to the east of the town. The 2006 census reported that the town has a population of 2,328.

2.2 Identification of Constraints

The identification of environmental and other constraints within the study area assists in determining potential routes for the planned transmission line. Constraints include physical (e.g. rivers, archaeology, lakes) environmental and legal constraints. A constraints map was produced at the end of the Phase One public consultation process. This is attached in Appendix B

Constraints were identified by:

- **Review of Planning and Environmental Legislation.** All EirGrid projects fully comply with current planning and environmental legislation.
- **Consultation with Expert Environmental Consultants.** Expert environmental consultants were commissioned to analyse the study area for environmental constraints. The detailed reports are contained in the Appendix C with areas of special designation/protection identified on the constraints map.
- **Aerial Photography.** Aerial photography for the study area was acquired. This aerial photography was used as a basis for the constraints mapping and was in itself used as a means of identifying environmental and other constraints in the area.
- **OSI Mapping.** OSI Mapping was obtained and used to identify potential constraints.
- **Public Consultation.** The identification of constraints also included consultation with statutory and non-statutory consultees as well as the general public (see section 2.4).
- **An Post Geodirectory.** The An Post Geodirectory information was obtained and mapped along with ongoing reviews of publically available data from Cork County Council. This can be seen on the constraints map
- **Local History.** The study area is particularly interesting in regard to Irish History and every effort has been made to identify and give due recognition and protection to any sites discovered. Identified were the Michael Collins Ambush Site and Memorial, and the Kilmichael Ambush Site and Memorial. A specific report was commissioned by EirGrid and is contained in Appendix C.

▪ **Site visit.** Frequent site visits were made by the project team to get a full appreciation of all identified constraints and the general appreciation of the topography/landscape and environmental character of the study area. No visits to private land were made at this stage of the process.

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2.3 Constraints Map Production & Summary

An explanation of all items on the map legend is contained in Appendix D

2.3.1 Man-Made Constraints

2.3.1.1 Human beings

The key constraints in relation to human beings are the following:

Settlements – Including the major towns of Dunmanway and Macroom and the villages of Ballineen, Coppeen, Castletown, Johnstown, Killnamatery, Kilmichael Kilmurry, Lissarda, Murragh, Newcestown, Teerelton, Tooms and Toon Bridge.

Physical Constraints – Major water features in the area will constrain the location of structures.

Areas of Tourism Interest – The location of structures in and relative to areas of scenic importance are to be carefully considered in order to minimise landscape impacts and associated attractiveness of the area for tourism and amenity purposes.

2.3.1.2 Cultural Heritage

The archaeological and architectural heritage features located within the study area can be categorised under the following headings:

National Monuments – 6 national monuments in state ownership are located within the study area.

Recorded Monuments – 1378 recorded monuments including 61 redundant records are located within the study area.

Protected Structures – 74 protected structures are located in the study area.

National Inventory of Architectural Heritage - 42 structures listed in the NIAH are located within the study area.

All of the sites identified within the study area comprise constraints to the proposed overhead line. Noticeable distribution patterns include the high numbers of fulachta fiadh (200), standing stones (182) and ringforts (325) which occur within the study area. This may be indicative of significant levels of

settlement in the study area in the Bronze Age and early medieval period. River banks are areas of archaeological potential/sensitivity and this is required to be considered in the route selection process. Whilst upland areas appear to have fewer recorded sites, this is due mainly to the lack of detailed upland archaeological surveys which have been carried out to date.

2.3.1.3 Existing infrastructure

Any proposed overhead line must maintain adequate design distance from existing infrastructure. The key existing infrastructure within the study area is as follows:

Roads

The N22 Cork to Killarney passes through the town of Macroom and is the only National route within the study area. A section of the new proposed Macroom bypass is also contained within the study area and visible on the constraints map.

The regional roads R584, R585, R586, R588, along with the above N22 form a road network in a general East-West configuration (from Cork City) connecting the majority of the population centres within the study area. The majority of the roads in the area are regional rural roads which typically contain intermittent one off housing.

Electrical Transmission Circuits

The study area contains existing 220kV and 110kV transmission infrastructure as described below and also contained on the constraints map.

220kV Stations

Clashavoon 220kV Substation

220kV Overhead Lines

Clashavoon – Tarbert 220kV Line

Clashavoon – Knockraha 220kV Line

110kV Stations

Dunmanway, Macroom and Carrigadrohid 110kV Substations

110kV Overhead Lines

Bandon – Dunmanway 110kV Line

Dunmanway – Macroom 110kV Line

Clashavoon – Macroom 110kV Line

Inniscarra - Macroom 110kV Line

Carrigadrohid – Macroom 110kV Line

Gas Transmission Pipeline

A section of An Bord Gais transmission network is contained within the study area and can be seen on the constraints map. It generally follows approximately 0.5km north of the R586, the Bandon to Dunmanway road.

2.3.2 Natural Constraints

2.3.2.1 Landscape

The study area can be divided roughly into two sections for the purposes of landscape constraints by a line to south of the River Lee, Tooms and the Inniscarra Reservoir.

The majority of the southern portion of the study area contains landscapes that have very high visual absorption capacity on account of the small scale enclosing topography together with the high frequency of areas of small forestry and scrub woodland. These approximate to Units 12 and 15 of the Cork County Council Landscape Character Assessment. There are a number of small hill tops and local roads which have the potential to create local visual impacts if they are crossed by an overhead line.

In the northern portion of the study area, which corresponds approximately with character Unit 13 of the Cork County Council Landscape Character Assessment, there are two distinct and different types of landscape effects. In this area, routes to the west of Macroom would all pass across broad open valleys of scenic significance with relatively little precedent for development. By contrast, routes to the east of Macroom would pass through much more visually enclosed and varied countryside which has significant levels of existing development, including overhead lines. Proposed crossing points of the Carrigadrohid reservoir should be considered carefully in order to minimise visual intrusion. Crossings in the

general in the vicinity of, or reusing, the existing 38kV overhead line corridor, would be more preferable than crossings to the west of the Annahala Reservoir.

2.3.2.2 Flora and Fauna

Following the identification of ecological features within the study area, the main ecological constraints relevant to the proposed overhead powerline include:

- Rare species: The avoidance of habitat that is potentially suitable to rare/ protected species has been recommended to avoid any potential adverse impacts. The most important areas for protected species have been identified as occurring within designated sites. Species most sensitive to the proposed development would include water bird species that are known to occur within the study area in significant numbers.

- Designated Sites: these sites are of known ecological importance and should, if possible be avoided in order to eliminate the potential for any direct impacts. The designated sites within the study area that are sensitive to indirect impacts would include the Bandon River SAC and the Gearagh SAC / SPA. Any potential deterioration of water quality would impact on the conservation status of either of these sites. Furthermore the potential for collision between birds and structures associated with the proposed development present a potential adverse impact on the conservation status of the Gearagh SPA.

- Non-designated Sites: The Inishcarra reservoirs and Toon Valley provide important habitats to water birds during winter. Both these sites are of importance to Whooper Swan which is known to be especially vulnerable to overhead powerline collision. Dunisky Souterrain is reported as an important site for the Lesser Horseshow Bat, a species listed on Annex 2 of the EU Habitats Directive.

- Fisheries: Important fisheries within the study area depend on water quality being protected throughout the two main river catchments. The main concerns in relation to the fishery areas are during construction and installation of pole-sets along the route: pole-sets can be positioned outside of streams and main channels to avoid direct impacts.

Based on the results of a Whooper Swan (Cygnus Cygnus) survey an area was outlined on the constraints map as an area recommended to be avoided by the proposed development. The avoidance of this area should eliminate potentially

adverse impacts on Whooper Swans that occur in the vicinity of the Inishcarra reservoirs. Whooper Swans are listed on Annex 1 of the EU Birds Directive (EU 79/409/EEC). EU Member states are required to maintain populations of rare and migratory bird species that are listed under Annex 1 by establishing designated areas – Special Protection Areas (SPA's) – for the conservation of these species. Whooper Swans are further protected under Annex II of the Berne Convention on the conservation of wildlife and natural habitats; they are also amber listed in 'Birds of Conservation Concern in Ireland' (Newton et al 1999; Lynas et al 2007) as internationally important numbers of Whooper Swan over-winter in Ireland.

2.3.2.3 Soils

The key constraints in relation to soils and geology are the following:

- Soft ground including blanket peat – there are a number of potential impacts associated with construction of structures in soft ground and blanket peat. Slope angle, accumulation of water following a high intensity rainfall event and the presence of drains in the vicinity of the construction area can lead to peat slope failure. On site machinery and dewatering activities are also contributing factors.

- Areas of made ground - these areas are located at urban areas (Macroom and Dunmanway) and residential areas (villages such as Cappeen, Kilmurry, Johnstown and Carrigadrohid). Cut material would be generated if construction was located in these areas; however the amount would not be significant.

- Registered operational quarries – foundations for the construction of the structures have the potential to be compromised by existing quarries and the extension to these quarries.

- Landfills and contaminated sites – sites located at Macroom and Dunmanway. Subsoil and underlying material at these locations would be potentially contaminated.

- Areas where rock is close to the surface – Bedrock would be generated as surplus material if construction was located in these areas. Due to the nature of the construction works the amount would not be significant. The surplus material would need to be managed in accordance with the Waste Management Act 1996 and amendments.

- Geological heritage areas – The Gearagh, River Lee is a site of geological interest within the study area. The GSI has stated that there are no set distance requirements for new developments in the vicinity of geological NHA's and County Geological Sites. Distance is decided on a site by site basis.

2.3.2.4 Water

The key constraints in relation to water are the following:

- Physical constraints – rivers, lakes and reservoirs located across the study area. The requirements for the crossing of water bodies would be the main constraint.
- Historical flooding- there is a history of flooding in some locations within the study area e.g. Macroom and Dunmanway. Cognisance should be made to the locations of these previous flood events when locating structures, particularly in the vicinity of watercourses and floodplains and other surface water features.
- Groundwater Supplies – a number of groundwater supplies have been identified from the GSI well database. Additional public or private water supplies may be present in the area.

The implementation of appropriate mitigation measures in the design and construction phase will ensure there will be no significant residual impact on the environment from the proposed development in respect of water.

2.4 Phase 1 Consultation

The project team are committed to engaging with all interested parties on this project and welcome any feedback on the project so far.

2.4.1 An Bord Pleanála

At the request of EirGrid a pre-application consultation meeting was held with An Bord Pleanála on May 18th 2010. The purpose of this consultation was to firstly confirm that the project was strategic under the Planning and Development (Strategic Infrastructure) Act 2006 i.e. that the planning application would be submitted directly to An Bord Pleanála as opposed to the local Planning Authority. It was also to discuss the scope, issues arising, and process of the project development, and ultimately the Statutory applications process. EirGrid also sought advice on its strategy for stakeholder and public consultation.

2.4.2 Statutory and Non Statutory Consultees

Consultation was undertaken by letter with statutory and non statutory consultees. These letters where followed up with phone calls, e-mails and meetings where requested. Details of all consultees are contained in Appendix E.

2.4.3 Public Consultation

Public consultation commenced on June 24th 2010 with the publication of newspaper notices. The aim was to obtain as much information as possible about the study area, and potential environmental and other constraints therein. All information received was incorporated into the constraints analysis, constraints mapping and ultimately into the route corridor selection process.

The public consultation strategy for this project took the form of:

- Briefing Document

The production of a project specific briefing document (see Appendix E) which provided contact details of the project team.

- Website

The provision of a project specific Web Page to facilitate widespread accessibility to project data and to facilitate the giving and receiving of information specific to the project. A dedicated email was setup for the project and a telephone number was provided for people to contact EirGrid directly.

- Open Day

Public information days were held in the Castle Hotel in Macroom on Tuesday 29th June between 3.00pm and 8.00pm and Wednesday 30th June between 11.00am and 8.00pm.

The public information days were advertised in both the Southern Star and the Corkman newspapers published on the Thursday 24th of June. These are also contained in Appendix E

A radio announcement was made on 96FM on the first day of the public information sessions.

2.4.4 Review

A period of one month from the public information day June 29th was given to the project team to accumulate information from statutory and non-statutory consultees, environmental consultants, the general public and local interest groups as well as research by the project team into possible constraints within the study area. An end date of July 31st was given to the constraints gathering phase of the project after which the route corridor identification phase would commence.

Chapter 3 - Route Corridor Identification

The constraints identified throughout the information gathering phase of the project were used to identify possible route corridor alternatives.

Potentially feasible corridors within which to route the planned transmission line were identified and subject to high-level assessment, utilising the criteria of environment, engineering and economy. This resulted in the number of route corridor options and sub-options, generally divided into a western corridor (Brown), a central corridor (Purple) and an eastern corridor (Blue). Appendix F includes a route corridor map showing all corridor options.

For ease of comparison and analysis, these corridors were further subdivided into sections and defined by nodes i.e. Western Corridor node 1 to 2 etc. These nodes can be seen on the map in Figure 9.

3.1 Western Corridor (Brown on constraints Map)

This corridor option runs for the most part in a generally northerly direction from Dunmanway as far as the existing N22 before turning in an easterly direction towards the existing Clashavoon station.

In summary:

- The landscape in general terms can be described as both hilly and enclosing and very rural in nature.
- There is minimal existing infrastructure in the area and the population density is the lowest of all proposed corridors. This corridor crosses existing 110kV electrical infrastructure at three locations.
- South of Kilmichael, the route corridor passes by the memorial of the historical Kilmichael Ambush. The corridor is of sufficient width to ensure no derogation of this site occurs.
- The area north of Kilbarry, as far as the proposed Macroom bypass, is situated within a Gaeltacht area.
- The corridor crosses a scenic route identified in the Cork Development Plan 2009, but avoids all other areas of designation i.e. Natural Heritage Areas (NHA's), proposed NHA's, Special Areas of Conservation (SAC), Special

Protection Areas (SPA) and scenic landscape. Indirect impacts on designated sites within close proximity to the route corridor must be examined.

3.2 Central Corridor (Purple on Constraints Map)

This corridor option runs for the most part in a generally northerly direction from Dunmanway as far as the village of Teerelton, where the corridor turns east towards Lissarda, before turning northward at Crossmahon toward Clashavoon substation.

In summary:

- The landscape in general terms can be described as hilly and enclosing as far as Teereeven. From here as far as the N22, the topography changes to a lower level, and is more open in nature. From the N22 to Clashavoon, the route corridor skirts an area of high ground before entering Clashavoon.
- The route corridor would require a water crossing in the vicinity of the townland of Rosnascalp.
- This corridor crosses the existing 110kV electrical infrastructure in at least four locations with a further four possible 38 kV crossings.
- The presence of one off housing means that this corridor slightly infringes upon an area designated as constrained, due to the possible presence of the Whooper Swan (Annex I species of EU Bird Directive).
- The corridor avoids all other areas of designation i.e. Natural Heritage Areas (NHA's), proposed NHA's, Special Areas of Conservation (SAC), Special Protection Areas (SPA) and scenic landscape. Indirect impacts on designated sites within close proximity to the route corridor must be examined.

3.3 Eastern Corridor (Blue on Constraints Map)

This corridor option runs for the most part in a generally north easterly direction from Dunmanway to where it crosses the existing N22 approximately 1km east of Lissarda. From here the route turns north to Clashavoon.

In summary:

- The landscape for this corridor is more diverse in nature, comprising areas of high ground interspersed within more open agricultural land.

- The eastern section of the study area is in general more developed in terms of existing infrastructure and population density.

- The route corridor allows for two possible water crossings in the vicinity of existing overhead lines and the existing substations at Macroom and Carrigadrohid.

- South of Beal Na Bláth, the route corridor passes behind and south of the memorial and location of the ambush of Michael Collins. The corridor is far enough away to ensure no derogation of this site occurs.

- The corridor avoids all areas of designation i.e. Natural Heritage Areas (NHA's), proposed NHA's, Special Areas of Conservation (SAC), Special Protection Areas (SPA) and scenic landscape. Indirect impacts on designated sites within close proximity to the route corridor must be examined.

Part B Overview of environmental issues

This chapter outlines the analysis of route corridors by the expert environmental consultants. The full reports can be found in Appendix G.

Chapter 4 – Consultant's Findings

4.1 Man-made Constraints

4.1.1 Human Beings and Landuse

There are no significant constraints in relation to human beings. The implementation of appropriate mitigation measures will ensure there will be no significant residual impact on the environment from the proposed development in respect to human beings. There are no significant impacts associated with any particular route corridor.

As regards landuse, the area generally comprises a mix of pastures, complex cultivation pattern and broad leaved, coniferous and mixed forests. The proposed development will therefore not have a significant impact on the landuse in the area.

4.1.2 Cultural Heritage

Cultural heritage sites include Recorded Monuments, Protected Structures and National Monuments. These sites were identified within each route so that an informed decision could be made regarding the avoidance of cultural heritage features during the line route selection process.

Eastern Route: This route contains 100 cultural heritage sites, five of which are large clusters of monuments. Many of the clusters of sites date to the same period, indicating the presence of archaeological landscapes. One example is the presence of 10 fulachta fia within close proximity to each other (Section 4.3.2 (node 12)). This may be indicative of a Bronze Age landscape and an area that was intensely utilised in the prehistoric period. Two ecclesiastical enclosures and associated monuments are located at Bawnatemple and Nedinagh East. Nodes 4-11 route alternatives both contain large clusters of monuments. The southern alternative of node 9-10 would be more preferable than the northern route on the basis that it contains fewer monuments.

Central Route: This route contains 47 cultural heritage sites and does not include any National Monuments. No large clusters of monuments are located

within this route therefore fewer potential impacts (direct and indirect) on cultural heritage sites are anticipated. Furthermore, there are lengthy stretches of land with no recorded monuments present. One example is between Rosnascalp and Curragh townlands (nodes 4-8) and Teerelton to Baulbrack townlands (nodes 7-8). Node 6-7 is more preferable than 5-7 on the basis that there are fewer recorded monuments. Nodes 6-5-1 is devoid of Recorded monuments and is the preferable route when compared to nodes 6-1 (eastern alternative).

Western Route: This route contains 53 cultural heritage sites one of which is a National Monument in State Ownership (Carrigphooca Castle). The DoEHLG have requested that a zone of visual amenity be established around Carrigphooca Castle which is a Recorded Monument, National Monument and a Protected Structure. While this zone is not defined in terms of size or distance, a zone of 300m was suggested in the initial constraints report. In order to negate any potential visual impacts on the castle, it is recommended that polesets and angle masts should not be visible from the monument and vice versa. While this route does not contain any large clusters of monuments, a number of recorded monuments are located centrally within the route. Conversely, there are few recorded monuments located between nodes 2-3 (western alternative).

4.1.3 Existing Infrastructure

Roads

Road crossings are unavoidable and the study area contains a large network of third class roads. These in themselves do not represent a significant constraint with current design/construction practices; however a large degree of one off housing is located along these roads.

The crossing of the National Primary Route the N22 is at an acceptable angle (ideally 90 degrees) on all route corridors; in general, the north-south configuration of route corridor options, combined with the east-west road configuration, lends itself to good crossings in the majority of cases.

Electrical Transmission Circuits

The northern section of the study area, east of Macroom is a highly constrained section of the study area. As well as the environmental considerations, there are two ESB substations at Macroom and Carrigadrohid. Both these stations have a

number of overhead lines entering and exiting, and adequate design distance must be maintained.

From preliminary review, a line route passing close to Macroom station would involve either crossing up to 4 existing 110kV Lines close to the station compound, or would require some of these lines to be realigned. Together with the ground profile (hills and depressions), a detailed design would be required before any proposal is made to select a route corridor in this area. Additionally, no benefit is to be gained by crossing along this section (node 11-4) when compared with Carrigadrohid. Carrigadrohid would have a lower density of overhead lines to be crossed, although the significant height difference as the route crosses the river could complicate the final line design.

Where the existing Clashavoon – Macroom 110kV line crosses the high ground around Knockarranaun, an opportunity exists to run the two lines parallel to each other with possible switching of routes limiting the visual effect of a new overhead line to an area already affected.

Bord Gais Transmission Line

The location of the transmission line to the south of the study area means it has no effect on the route corridor options.

4.2 Natural Constraints

4.2.1 Ecology

There are a number of potential impacts identified that are common to each route corridor including: local disturbance to fauna during construction phase, localised disturbance and loss of habitat (at locations of angle towers and pole sets); and, potential disturbance to ecology of watercourses at crossing locations. However, the route corridors have not been set apart based on these potential impacts based on an assumption that they are likely to be comparable across all corridors.

The tables below summarise sites of known ecological importance within 2km of the proposed route corridors.

Name	Site Code	Status	Approximate distance from corridor (nearest point)
The Gearagh	108	SAC / pNHA / NNR	1.5 km to East, between Node 3 and 4
The Gearagh	4109	SPA	1.5 km to East, between Node 3 and 4
Prohus Wood	1248	pNHA	1.9 km to West, between Node 3 and 4
Toon Valley	NA	NA	0.5 km East, between Node 2 and 3 (eastern alternative)
Lough Allua	1065	pNHA	0 km West, between Node 2 and 3 (western alternative)
Bandon River	2171	SAC	0.2 km to South, between Node 2 and 3 (western alternative)

Table 1: Sites of known ecological importance occurring within 2 km of Western route corridor (from North to South).

Name	Site Code	Status	Approximate distance from corridor (nearest point)
The Gearagh	108	SAC/pNHA /NNR	2km to West, between Node 4 and 8.
The Gearagh	4109	SPA	2km to West, between Node 4 and 8.
Sullane Delta	NA	NA	0km; Corridor passes through part of this site at Mashanaglass, between Node 4 and 8.
Dunisky Culvert	NA	NA	0.5km West, at Node 8
Dunisky Souterrain	NA	NA	1km North, between Node 7 and 8
Boylegrove Wood	1854	pNHA	1km North-west, between Node 7 and 8
Bandon River		SAC	0.5km West, between Node 1 and 5

Table 2: Sites of known ecological importance within 2 km of Central Route Corridor (from North to South).

Name	Site Code	Status	Approximate distance from corridor (nearest point)
Inishcarra Reservoirs (subsite: Sullane Delta)	NA	NA	0 km; Corridor passes through part of this site between node 4 and 11.
Dunisky Culvert (subsite of Inishcarra Reservoirs)	NA	NA	1.5 km West, at Node 11
Lough Gal	1067	pNHA	0 km North-east, at Node 13 (eastern alternative)
Manch Bridge	NA	NA	1.9 km South, at Node 9
Bandon River	2171	SAC	0.5 km East, at Node 1
Killaneer House Glen	1062	pNHA	1 km South, between node 9 and 10

Table 3: Sites of known ecological importance within 2 km of Eastern Route Corridor (from North to South).

The most preferred route is the Eastern Route Corridor as the potential for adverse ecological impacts on habitats and species of ecological importance is considered lowest. The western of the two alternatives between Node 4 and 11 is preferred as it is more removed from Lough Gal pNHA. Further south, no distinction is made between the two alternatives between Node 10 and 9 as ecological impacts are likely to be comparable.

An equally preferable route could include a combination of the northern part of the Eastern Corridor (western alternative between Node 4 and 11) with the southern part of the central corridor (any of the alternatives between Node 8 and 1).

The Western Route Corridor is the next preferred option. However, there is potential for adverse impacts on the River Bandon SAC due to proposed river crossings upstream. During the construction phase, site preparation to facilitate the construction of angle towers could lead to deterioration in water quality of surface waters downstream. Of the two alternative sections between Node 2 and 3, the eastern alternative is preferred as it is further removed from both Lough Allua pNHA and Bandon River SAC. This section also avoids two river crossings upstream of the Bandon River SAC.

The least preferred corridor is the Central Route Corridor due to potential adverse impacts on important bird species associated with the Inishcarra Reservoirs. The two alternative sections between Node 1 and 7 are not differentiated as potential ecological impacts associated with each are deemed to be comparable. As mentioned above, a combination of the southern part of the Central Route Corridor (Node 1 to 8) with the Northern part of the Eastern Route Corridor would produce a route corridor (western alternative between Node 4 and 11).

4.2.2 Landscape

The north-south routes traverse an area of east-west trending low hills. This means that all routes will have issues of being occasionally located across hill-tops. On the other hand the varied topography, smaller fields sizes and relatively sparse settlement patterns provide mitigation against significant visual impacts over wide areas for all three routes.

Western Route Corridor

This route skirts the northern part of landscape to the west of Macroom that Cork County Council has designated as a scenic area. It also crosses the visually vulnerable river valley of the Sullane – west of Macroom, and is likely to be visible over a wide area from the N22 as it crosses the ridgeline near Dromagarry in this area.

The eastern variant of this route will be very visible as it crosses the open level river valley of the Toon River and will be prominent on the skyline near Kilbarry in the same area.

Both the eastern and western variant will intrude upon the skyline when seen from the designated scenic route that runs south of Kilbarry. The southern portion of both variants pass through complex and relatively sparsely populated countryside – the western variant traverses a significant number of hill tops.

The southern sections will be visually prominent on the skyline when seen from the northern outskirts of Dunmanway.

Central Route Corridor

This route traverses a relatively sparsely populated upland area in its centrals section – though the northern part of the route contains a significant number of angle masts (node 4 – 8) located on elevated and conspicuous ground that can be seen from many parts of the Carrigadrohid reservoir and its shores as well as from the scenic route that runs to the north of the reservoir. The large number of angle masts over a short distance in this northern part of the route has the potential to create locally significant visual impacts.

The central and southern portion of the route (both variants) contain significant numbers of conspicuous skyline locations – especially of angle masts. It will be visible on the skyline form the scenic route to the east of Dunmanway.

Eastern Route Corridor

This route also traverses the Carrigadrohid reservoir, scenic route and N22 east of Macroom - but does so in a more direct and less obtrusive manner – compared to other routes. There is still the potential for significant – if localised – residual visual impacts in the vicinity of Carrigadrohid. The remainder of this route appears to have fewer angle masts located on topographic prominences and to generally follow the flanks of elevated areas to a greater extent than the other routes. It will be the least visually conspicuous route as seen on approach to Dunmanway.

Combined Route Corridor

This route combines parts of the Eastern and Central Routes. It is distinctive because it maximises the extent to which the new route parallels the existing 110kV route in the sensitive northern and southern portions of the project.

The crossing of the sensitive eastern part of the reservoir – at Carrigadrohid – occurs close to the existing 110kV lines, which confines impacts to areas that are already affected. Thereafter, the route corridor travels in valleys between high ground.

The southern portions of the route [south of Pike Cross Road] run parallel and close to the existing Dunmanway – Macroom 110kV line, which confines impacts to areas that are already affected.

4.2.3 Soils and Geology

The potential impacts relating to the soils and geology are generally related to the construction phase and the management of machinery on site. The application of mitigation measures at construction stage will ensure that the residual potential impacts at all route options are imperceptible during both the construction and operational phases of the development.

In terms of the route corridor selection, the level of potential impact identified is slight negative for all route corridors. The least preferred option is the Western Corridor due to the presence of blanket peat at a larger scale than the other route corridor options.

4.2.4 Water

The potential impacts relating to the water environment are considered slight negative, and are generally exclusively related to the construction phase. The application of mitigation measures will ensure that the residual impacts of each route option are imperceptible during both the construction and operational phases.

In terms of the route corridor selection, the level of impact identified is slight negative for all route corridors. The least preferred option is the Central Corridor due to the presence of a number of rivers along the route corridor in comparison with the other 2 corridors, and the presence of a gravel aquifer at Warrenscourt, 2km northwest of Kilmurray.

Chapter 5 – Modifications based on the above

It is considered that in some locations, small modifications to route corridors may result in overall increased benefits. These locations are identified below. These modifications along with all comments received from the consultation phase will be further investigated and considered in Phase 2 of this project. The presence of one off housing however makes re-routing difficult in localised areas.

5.1 Western Corridor

By far the most significant constraint on this route corridor option is Carrigaphooca Castle located, between nodes 3 and 4. Given the location of dwelling houses in the area, any rerouting of the corridor would mean further traversing the visually vulnerable landscape of the Sullane Valley (see Landscape report attached in Appendix F). Further investigation is required to assess the impact of the proposed corridor on Carrigaphooca Castle.

5.2 Central Corridor

Minor broadening of the route corridor in the area north of Teerelton, Lisheenleigh and Shanacashel would allow extra scope in the route selection phase to reduce the potential impact on local housing, and to minimise the number and severity of line angles.

5.3 Eastern Corridor

Node point 14 was inserted to allow for paralleling of the existing 110kV overhead line on an area of high ground north of Carrigadrohid.

The following modifications require further investigation, but could improve routing options:

The route corridor could be broadened in the vicinity of Killinardrish to allow for paralleling of the existing 110kV overhead line, and so avoid cultural heritage sites.

A section of corridor could be added north of Shandangan West to connect nodes 11-4 and 11-12, to give a possible alternative to crossing high ground in the eastern section of this corridor option.

Part C Lead Consultant's Recommendation

Chapter 6 – Conclusions and Recommendation

It is the lead consultant's responsibility to review all expert inputs into the project and to evaluate and prioritise one element over another with the aim of identifying an emerging preferred route corridor. The method in which this was done is detailed below.

6.1 Review

Review of the evaluation and recommendations on each route corridor option received from expert consultants (outlined in chapter 5 above)

The information is presented in concise tabular format (tables 4,5 and 6) to visually represent data received.

For ease of description each identified route corridor option is broken into sections identified using the node points marked on the constraints map PE687-D193-008-001-000 in Appendix F. The route corridor sections are then assessed relative to each other based on the constraints identified in sections 2.2 and 2.3 and evaluated in chapter 4. In this way, if no one route in its current form distinguishes itself as being the optimum route corridor, based on all relevant criteria, then possibly a hybrid route corridor, comprising node sections from a number of route corridor options, may be preferable.

6.2 Route Corridor Appraisal

Tables 4, 5 and 6 summarise the evaluation outcome of the three identified route corridor options (Western, Central and Eastern). Where constraints exist, a brief overview summary is included. Further details on these constraints can be found in the consultant's reports. (Appendix F).

The following colour code is used:

	Emerging Preferred. From initial review, route corridors in this group best avoid all constraints identified.
	Less Preferred. From initial review, route corridors in this group are somewhat less preferred, as some indirect effects on identified constraints may occur. It is, however, expected that with further investigation and/or minor route diversions, no indirect effects will occur, and these corridors could become emerging preferred.
	Least Preferred. From initial review, route corridors in this group are the least preferred of the options, as some direct effects on identified constraints may occur. The effects are predominantly visual in nature, however, it may be the case that, with further investigation, mitigation and/or minor route diversions no significant direct or indirect effects could occur.

Given the large number of variables in the tables produced i.e. the 10 constraints and the various node sections on all three corridor options; it is difficult to visualise any route corridor options. The results of the comparative evaluation above were therefore transferred to the constraints map in order to illustrate the results, and to identify the emerging preferred route corridor(s). See Figure 9 below.

Criterion	Element	Western Corridor			
		1-2	2a-3	2b-3	3-4
Economic	Length	The minimum length of the Western corridor is 36km, the maximum length 38km			
	Possible number of Angle structures	The minimum number of angle structures (Preliminary review) is 24			
Environment	Human Beings				
	Cultural Heritage				Carrigaphooca Castle 4 protected structures
	Flora and Fauna	Crossing tributaries of an SAC	Crossing tributaries of an SAC		
	Landscape/Visual	Careful line route selection will minimise any impact. This will be detailed in phase 2 report.			
	Hydrology and Hydrogeology				
	Soils and Geology		Blanket Peat	Blanket Peat	
Existing Infrastructure	Roads	1	3	4	2
	Transmission Lines	1	0	0	1
	Bord Gais pipeline	No impact			

Table 4: Primary Appraisal of the Western Route Corridor

Criterion	Element	Central Corridor					
		1-5	1-6	5-7	6-7	7-8	8-4
Economic	Length	The minimum length of the central corridor is 38km, the maximum length is 40km					
	Possible number of Angle structures	The minimum number of angle structures (Preliminary review) is 19					
Environment	Human Beings						
	Cultural Heritage No national monuments					2 Protected structure Crossmahon house and Ardaneneen House.	
	Flora and Fauna						Possible impacts on The Gearagh SPA
	Landscape	Careful line route selection will minimise any impact. This will be detailed in phase 2 report.					
	Water					Gravel aquifer	
	Soils and Geology						
Existing Infrastructure	Roads (N and R roads)	1	1	1	1	1	0
	Transmission Lines	0	0	1	1	1	2
	Bord Gais pipeline	No impact					

Table 5: Primary Appraisal of the Central Route Corridor Option

Criterion	Element	Eastern Corridor										
		1-9a	**1-9b**	**9a-10**	**9b-10**	**10-11**	**11-4**	**11-12**	**12a-13**	**12b-13**	**12-14**	**13-4**
Economic	**Length**	The minimum length of the eastern corridor is 39km, the maximum length is 41km										
	Possible No of Angle structures	The minimum number of angle structures (Preliminary review) is **22**										
Environment	**Human Beings**											
	Cultural Heritage		Ecclesiastical enclosure	(round tower) 274m to south			Ecclesiastical enclosure	Cluster fulacht fia	Cluster of bronze age monuments			Cluster of bronze age monuments
	Flora and Fauna											Possible effect on pNHA
	Landscape	Careful line route selection will minimise any impact. This will be detailed in phase 2 report.										
	Water											
	Soils and Geology											
Existing Infrastructure	**Road Crossings**	1	1	2	2	1	1	0	1	1	1	0
	Transmission Lines Crossings	0	0	1	1	0	4	1	1	1	1	0
	Bord Gais Pipeline	No impact										

Table 6: Primary Appraisal of the Eastern Route Corridor Option

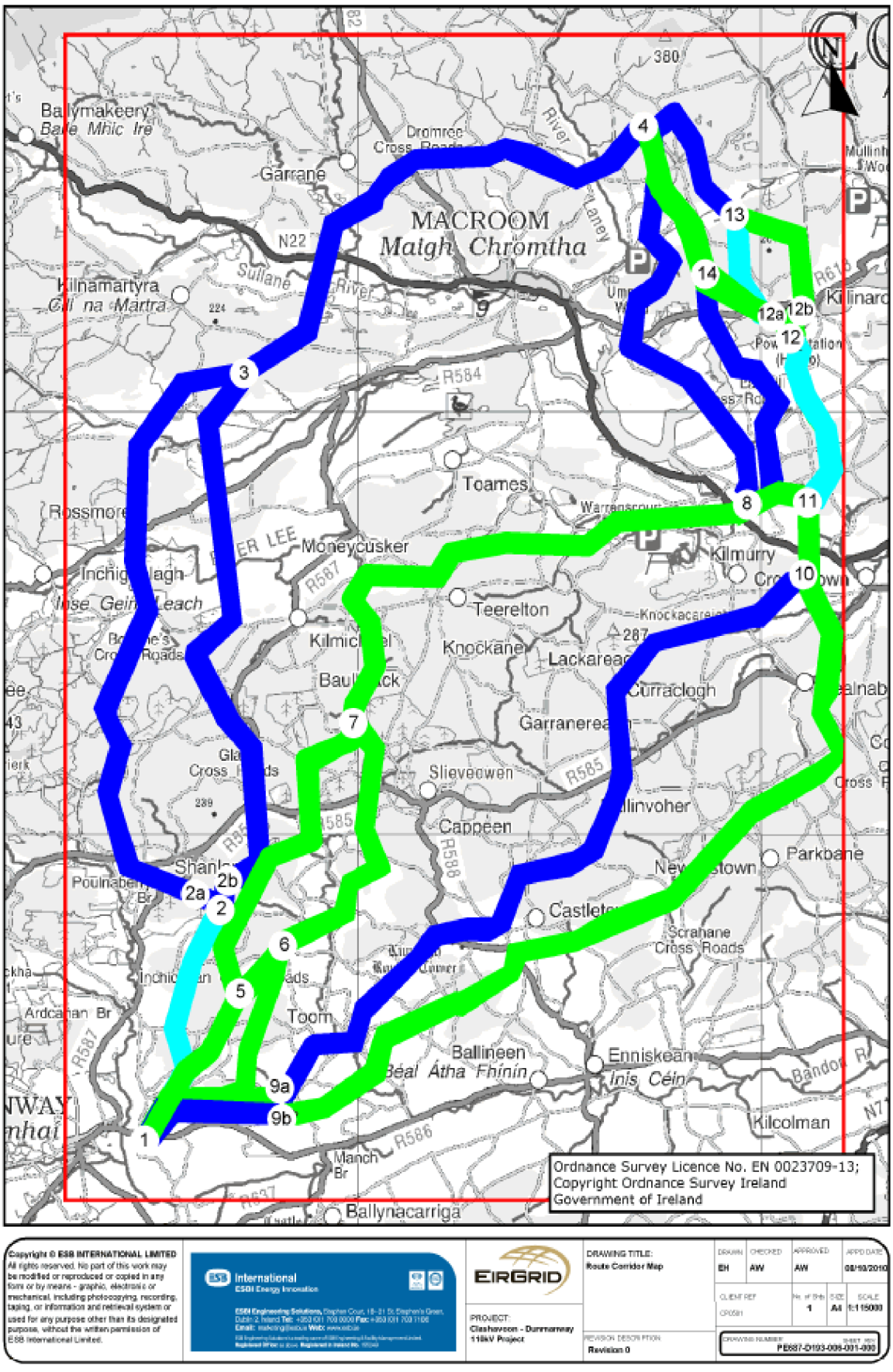

Figure 9: Route Corridor Options

6.3 Determine Route Corridor Options

It is apparent that, at this stage, all route corridors appear to be feasible, on the assumption of further study, careful line routing, and mitigation measures. However, based on the environmental and other information, and in reference to Figure 9 above, two route corridor options emerge as preferable solutions:-

6.3.1 Emerging Preferred Route Corridor A

Based primarily upon the Eastern Route Corridor (but comprising a hybrid of identified corridor options): following from node 1 (Dunmanway 110kV station), through nodes 9b,10,11,12,14, and terminating at node 4 (Clashavoon 220kV Station). This route corridor is approximately 38km in length. A preliminary review of route options would put the minimum number of angles on the corridor at approximately 24. See Figure 10 on the following page.

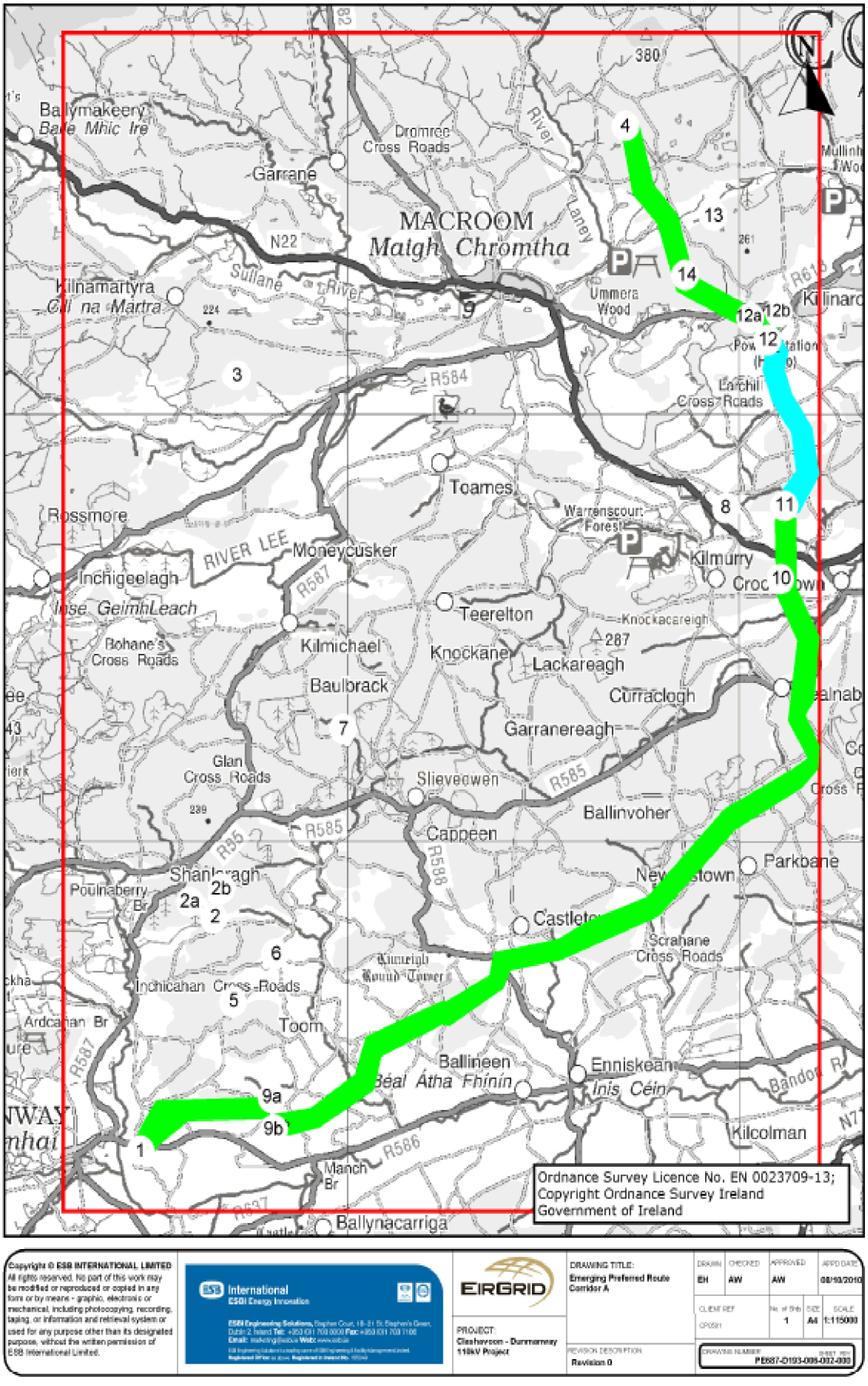

Figure 10: Emerging Preferred Route Corridor A

6.3.2Emerging Preferred Route Corridor B

Based primarily upon the central/eastern route corridors (but also comprising a hybrid of identified corridor options): from Node 1 (Dunmanway 110kV station), through nodes 5,7,8,11,12,14, and terminating at node 4 (Clashavoon 220kV station). This route corridor is also approximately 38km in length, and a preliminary review of route options would put the minimum number of angles on the corridor at approximately 19. See Figure 11 on the following page.

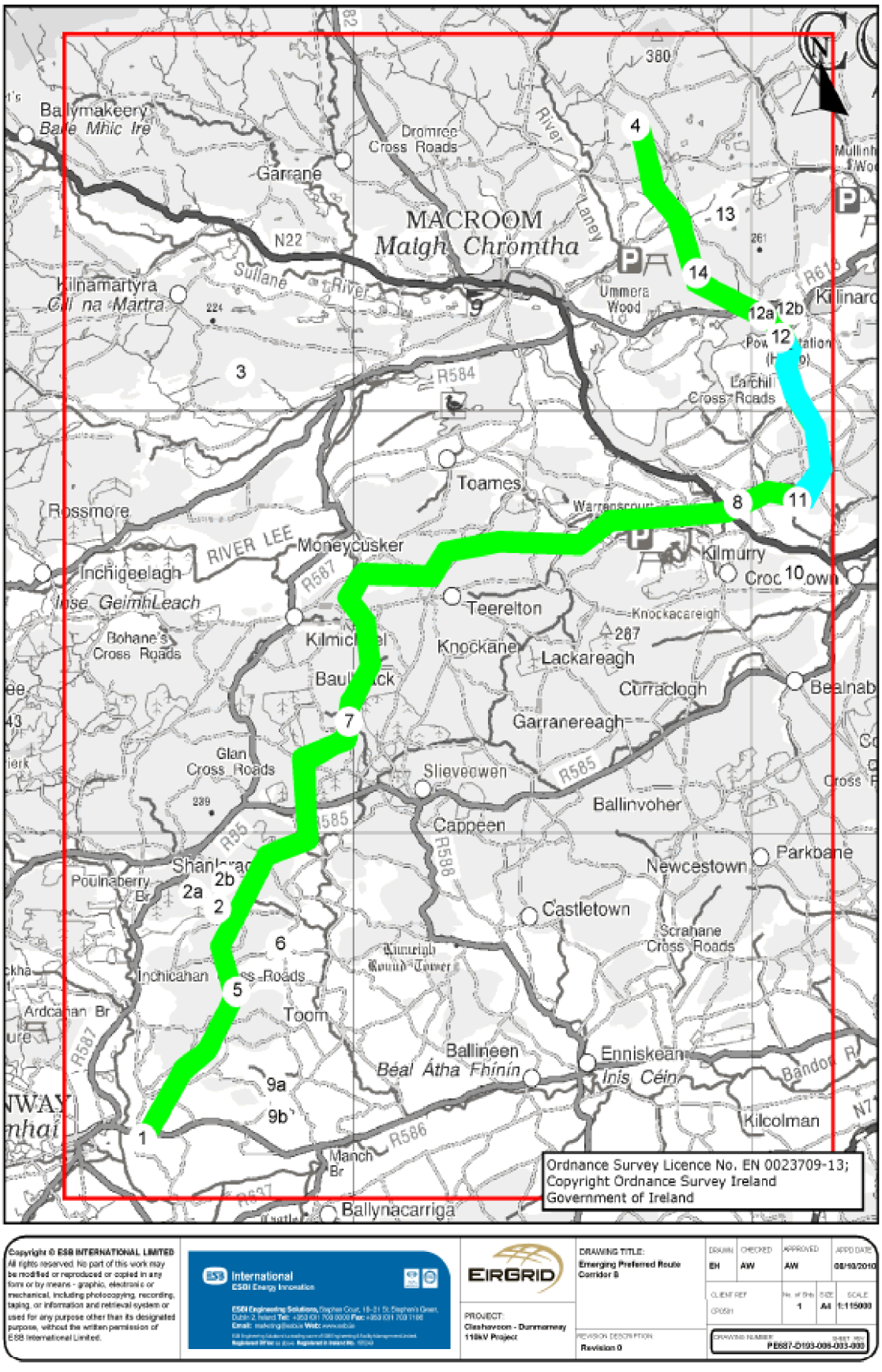

Figure 11: Emerging Preferred Route Corridor B

6.4 Selection of the Emerging Preferred Route Corridor

In essence, any route corridor out of Clashavoon 220kV substation would require to pass either to the east or west of the greater Macroom area. Environmental constraints, and in particular the significant presence of the Whooper Swan, eliminated a large section of the study area in terms of route corridor selection. The choice was to route west over terrain that is largely undeveloped in terms of infrastructure, or to route east across land that has already seen a large degree of infrastructural development, primarily due to the presence of both Macroom substation and Carrigadrohid generating station. From the evaluation above, it is evident that, given all parameters routing to the east of Macroom is the preferred option.

Due to the extent and location of constraints in the area, i.e. existing infrastructure and Cultural Heritage sites, both emerging preferred route corridors share a common route corridor in the northern section of the study area.

Although both these corridors are generally comparable in terms of environmental impact and route length, Route Corridor option B would have distinct advantages:-.

- The area traversed by the route corridor from node 11 southwards to Dunmanway has a much lower population density, and the visual impact on individual and community is therefore much lower than Route Corridor A.
- The estimated minimum number of angle structures on Route Corridor B is 19 compared to 22 on Route Corridor A.
- It is acknowledged that due to the hilly character of the landscape crossed by Route Corridor Option B, any line route chosen within the corridor would be visible in the landscape at some locations. Careful and sensitive line design should minimise this impact by avoiding placing structures on the crest of hills.

6.5 Lead Consultant's Recommendation

Having reviewed all data, it is the opinion of ESB International as Lead Consultants that the project proceed to the second phase of public consultation with Route Corridor Option B (Figure 11) comprising the emerging preferred route corridor for the Clashavoon – Dunmanway 110kV Project. Appendix H includes a detailed map of this route corridor option.

Appendices

Due to the large amount of data contained within these appendices, they are contained in a separate booklet which can be either:

- Viewed and downloaded from the project website, www.eirgridprojects.com/projects/clashavoondunmanway or
- requested from the project team at the contact details below:

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Appendix A EirGrid policy on OHL V's UG

Appendix B Phase 1 - Constraints Map

Appendix C Environmental Reports – Constraints Identification

C-1 Human Beings

C-2 Cultural heritage (inc. History)

C-3 Ecology (Flora and Fauna inc. Whooper Swan survey)

C-4 Landscape/Visual Impact

C-5 Soils and Geology

C-6 Water

Appendix D Explanation of Map Legend

Appendix E Phase 1 Consultation

E-1 List of Statutory/Non Statutory Consultees

E-2 Sample of Consultation Letter

E-3 Project Briefing Document

E-4 Newspaper Notices