



# North Kerry Project

Stage One: Consultants Constraints Report

PE687-F0273-R273-001-002

October 2011

## Stage One Report



**ESBI** Engineering

## **Part D Appendix**

### **Appendix 1.0 Review: initial independent consultants findings**

#### **A. Consultant's findings NK s/s and corridor options - Environmental Constraints**

##### **A.1 Introduction**

It is the lead consultant's role to review all of the initial expert reports and inputs into the project, and to evaluate all criteria with the aim of identifying the emerging preferred NK solutions and progression. These initial findings are summarised under the following headings:

##### **A.2 Man-made Constraints**

###### **A.2.1 Human Beings and Landuse**

This preliminary report was prepared by AOS Planning Limited. The report identifies the constraints associated with human beings that exist in the study area associated with the proposed NK project.

The north-western section includes the urban area of Listowel and surrounding townlands, the central section is made up primarily of agricultural land use with undulating topography including upland areas to the south around the village of Knocknagashel; the south eastern section includes the town of Abbeyfeale.

The south west and mid west regions both contain highly scenic areas which are important tourist attractions, with associated economic activity. They are strongly performing regions across a number of economic indicators; the large towns in the regions are home to the headquarters of many multinationals engaged in the food, electronic and pharmaceutical sectors. Major employers in Listowel include Kerry Ingredients and Spectra Laboratories. Whilst these employment sectors are not within the specific study area, it is important to understand that they have regional impacts in terms of socio-economics which impact on the study area. To ensure

continued economic growth and to enable regional towns and villages to meet their obligations under the Regional Planning Guidelines the provision and security of energy infrastructure in particular is essential is today's business community.

Scenic Routes: Whilst parts of the study area are attractive for tourists, the study area generally is not identified in tourist publications as having any tourism related driving, cycling or walking routes. However, the Kerry County Development plan identifies a number of views and prospects. These are mainly located along the upper slopes of the River Feale valley and Smearleagh River.

A wide range of recreational and amenity activities are likely to take place throughout the study area including equestrian activities, cycling, walking, fishing, etc. and there a number of accommodation providers including B&Bs, hotels, farmstays and self-catering.

Landuse: The area generally comprises a mix of pastures, complex cultivation patterns and coniferous and mixed plantation. The proposed development will therefore not have a significant impact on the landuse in the area.

*Conclusions: there are no significant constraints in relation to human beings or factors which will impact significantly on site or corridor selection.* Cognisance will be taken of the highlighted constraints during the preparation of the environmental assessments which will be submitted with the planning application. The implementation of appropriate mitigation measures in the environmental reports will ensure there will be no significant residual impact on the environment from the proposed development in respect of human beings.

## **A.2.2 Cultural Heritage**

Undertaken by Moore Group (incl. Tobin's) was commissioned to assess the cultural heritage resource of the study area and to determine how this would be affected by the proposed development as well as to make recommendations as to the cultural heritage sensitivity of each corridor and substation site area option. This report reviews the initial six route corridor

options with the associated deviations, and the 18 no. candidate substation site options for the planned North Kerry 220/110kV substation.

Cultural heritage sites include recorded monuments, protected structures and national monuments. These sites were identified within each corridor so that an informed decision could be made regarding the avoidance of cultural heritage features during the initial line route corridor selection process.

For the purposes of this report, the definition of “cultural heritage” is taken broadly from the UNESCO convention concerning the protection of the world cultural and natural heritage, 1972, which considers the following to be “cultural heritage”:

- Monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;
- Groups of Buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;
- Sites: works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.

Due to the rugged nature of the terrain there are relatively few sites in the Record of Monuments and Places (RMP), Record of Protected Structures (RPS) or Demesne Landscapes or Historic Gardens on the Ordnance Survey Ireland (OSI) first edition maps. The cultural heritage sites that do survive vary greatly in terms of type and date, from Bronze Age barrows and standing stones, early Christian earthworks, enclosures and churches and holy wells to 18th/19th century country houses and vernacular dwellings. The nearest National Monument in the area is the 15th century

Geraldine Castle in Listowel. Other sites of national interest include a number of buildings in Listowel decorated by the master Plasterer Pat McAuliff (1846-1921). McAuliff's indelible style is found on a number of shop and house facades and represents an eclectic mixture of classical, art nouveau, Celtic and Byzantine influences.

All townlands located within 5km of the centre line of each Route Corridor Option and candidate substation site area option were listed and cross referenced with National Monuments Lists for Counties Kerry and Limerick from [www.archaeology.ie](http://www.archaeology.ie); townlands within 2km were cross referenced with the list of sites under Preservation Orders, a list available from the Department of Environment Heritage & Local Government (DoEHLG).

All churches and graveyards which have the potential to be in the ownership of the Local Authorities were highlighted as potential National Monuments.

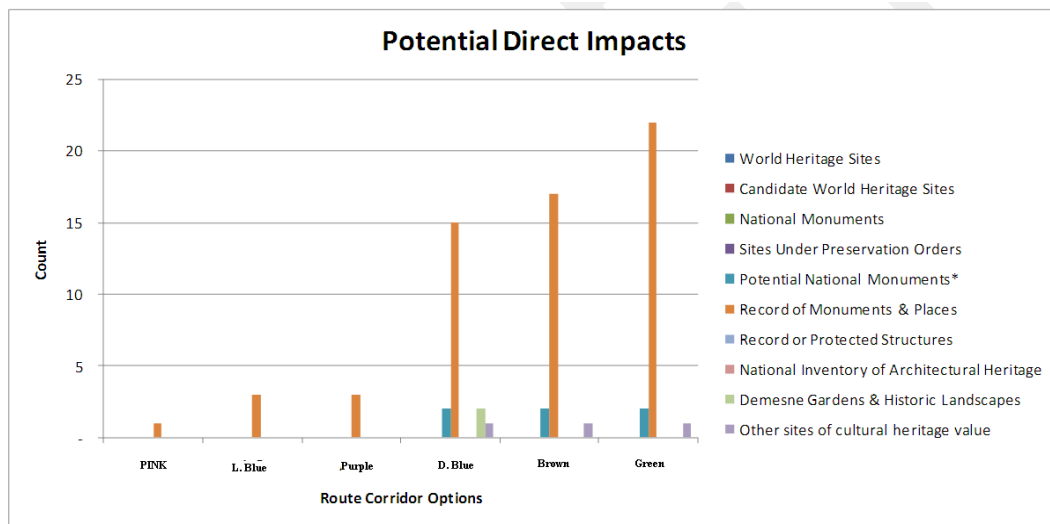
*There are no World Heritage Sites or Candidate World Heritage sites within the vicinity of the study area.*

A review of the National Monuments lists confirms that there are no National Monuments in the ownership or guardianship of the state located within the study area. The nearest National Monument is Listowel Castle, located in the town of Listowel, approximately 4.5km to the west of Trien 110kV Station.

The most western corridor option (PINK), the most westerly route does not impact directly on any known cultural heritage sites or demesnes. It may potentially indirectly impact on three sites including an enclosure at Derrindaff (RMP KE017-010) and a cashel and enclosure site on the summit of a hill at Lacka West/Lisroe (RMP's KE017-011 & 28). This option would have an overall slight significance of impact.

Due to the small footprint required for constructing overhead lines it is usually possible to avoid direct impacts upon known cultural heritage sites. However given its upstanding linear form, it is generally more difficult to avoid impacts on the setting of some cultural heritage sites. This constraint is considered at this initial design stage whereby key sites are avoided. A potential impact from this type of development may impact upon setting

during the operational phase, these have been addressed during the initial Constraints Mapping and Route Selection phases of a proposed development. For example substation site area option 4 was assessed as having an imperceptible impact as was the PINK route corridor option (Fig. A.2.2.1).



**Figure A.2.2.1** Summary of Cultural Heritage Sites that are located within 500m of the identified route corridor Options.

In the summary above of cultural heritage sites, it shows what could potentially be directly or physically impacted upon, that are located within 500m of the identified route corridor options

In conclusion the following recommendations were made:

*CH Decision Point: Substation site area Option 4 near Kilmeany is the preferred candidate substation site area option given its discreet siting near a river valley taking advantage of existing tree cover, and set back from local access ways. Furthermore there are no cultural heritage sites in the immediate vicinity.*

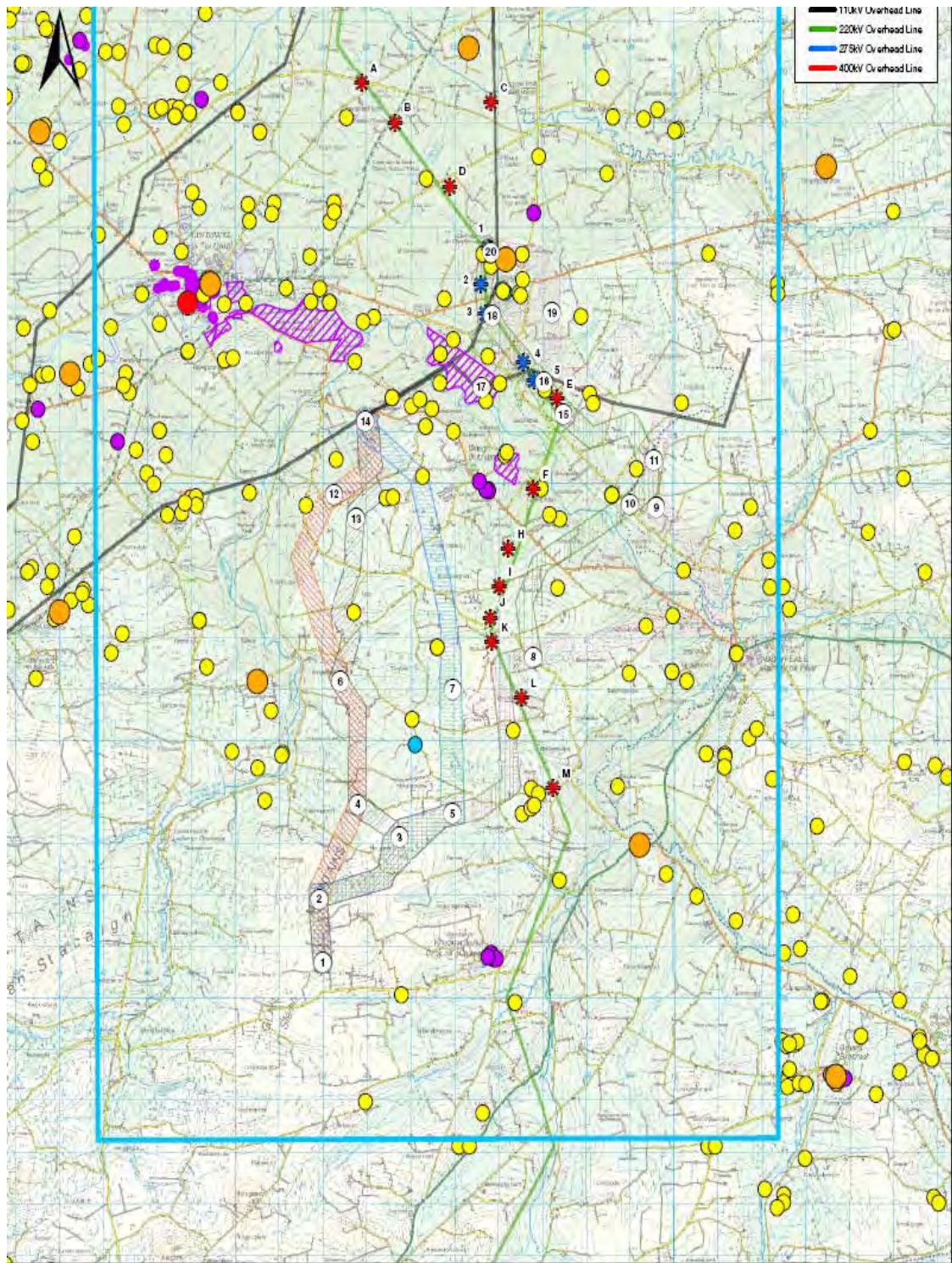
*CH Decision Point: In terms of potential impacts on the cultural heritage, the preferred route corridor option for the OHL is corridor option PINK from Cloghboola to the existing Station at Trien.*

Appropriate project design and mitigation measures can be undertaken to ensure this scheme has the least number of significant direct impacts on cultural heritage sites.

With regard to the former demesne landscape close to the southern loop connection between the Tarbert – Trien 110kV line and NK stations site, the main tree lines can be mostly avoided. Alternatively, moving this corridor to other areas may negatively impact on local housing, in terms of protected visual amenity and have increased impact on other constraints. There is no visible trace remaining of the former house or gardens of this particular demesne, in this area, this has now returned to its former agricultural use.

Direct impacts on known cultural heritage sites should be mitigated by avoidance at the design stage. Additional cultural heritage impact assessments will be carried out as part of the design stage two and the planning submission, as required for the preferred route corridor and substation site area. This will include detailed methodology for works and appropriate local site mitigation measures if required.





<b>Legend</b> Study Area Candidate 220 kV site Supplementary 220 kV Sites <b>Route Corridors to Thion</b> Nodes 1,2,4,6,12,14 Nodes 1, 2, 3, 4, 5, 13, 14 Nodes 1, 2, 3, 5, 7, 14 <b>Route Corridors to North Kerry 220 kV Station</b> Nodes 1, 2, 3, 5, 7, 15, 16, 18, 19, 20 Nodes 1, 2, 3, 5, 8, 10, 11, 15, 16, 19, 20 Nodes 1, 2, 3, 5, 8, 9, 11, 16, 18, 19, 20		National Monuments Potential National Monuments Record of Monuments & Places Record of Protected Structures National Inventory of Architectural Heritage Demesne Landscapes & Historic Gardens Other Cultural Heritage Sites	<b>Project:</b> North Kerry Project  <b>Client:</b> TOBIN Consulting Engineers for EirGrid  <b>Project Director:</b> Billy Quinn  <b>Prepared by:</b> N. Macdon <b>Scale:</b> 1:75,000 @ A3 <b>Date:</b> Oct 2010  <b>Drawing:</b> Figure 1 - Cultural Heritage Sites on Discovery Series Mapping	 archaeological & environmental services corporate house dalybrill business park galway  p : 091 765640 f : 091765641 e : info@mooregroup.ie w : www.mooregroup.ie
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Figure A.2.2.2 Cultural Heritage findings.



## **A.3 Existing Infrastructure**

### **Roads**

Road crossings are unavoidable within the study area: It has regional roads (R555, R523), two national routes (N21, N69) and a large network of local roads. These in themselves do not represent a significant constraint with current design/construction practices; however a large number of single dwellings are located along these roads. Given the scattered nature of these developments, it is impossible to avoid all sites; however the NK station area and line routes will seek to avoid existing dwellings wherever possible by seeking to retain an initial 50m amenity buffer where possible.

In general, the north to south configuration of many route corridor options, in contrast to the east-west road configuration, lends itself to limited impact of crossings in the majority of cases.

In choosing the substation site, consideration should be given to the capability of the access roads to accommodate construction traffic and the availability of alternative routes for local traffic. Similar considerations should be given to the location of a materials depot. Some new roads or road widening may be required (to be determined) to facilitate connections from the SPA towards the substations.

The project will need to comply with National Roads Authority guidelines. Overall however, there are no significant constraints from a general traffic perspective within the study area.

### **Electrical Transmission Circuits**

The study area contains both 220kV and 110kV transmission infrastructure and is shown on the NK constraints map. The area east of Trien 38/110kV substation is constrained with two existing 110kV parallel and 38kV lines.

This has been considered during the design stage including the comments and feedback from local residents. As Trien 110kV station already has a number of overhead lines entering the station from this direction; adequate design distance must be maintained.

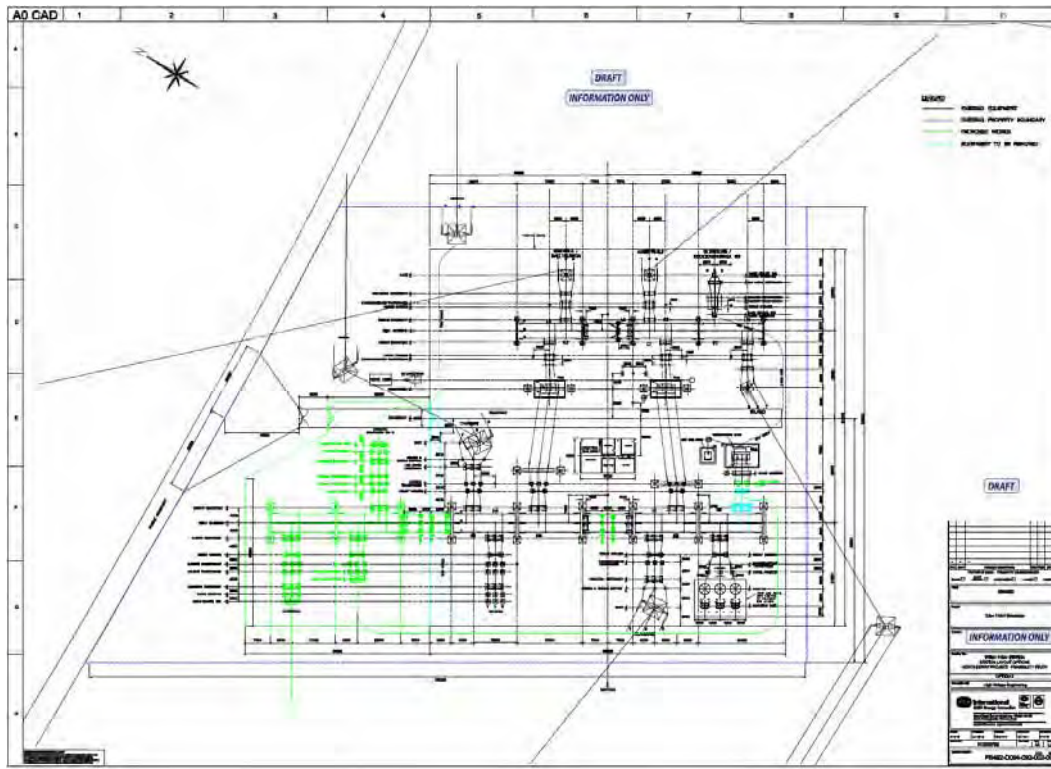
*HV Decision Point: in considering environmental, routing amalgam, capacity and technical constraints, the emerging preferred connection option for the Cloghboola windfarm is to Trien 110kV station.*

### **Existing 110kV Transmission station at Trien. (TL Trienearagh)**

A connection from Cloghboola windfarm into the existing 110kV substation at Trienearagh (Trien) will require some works at this existing station.

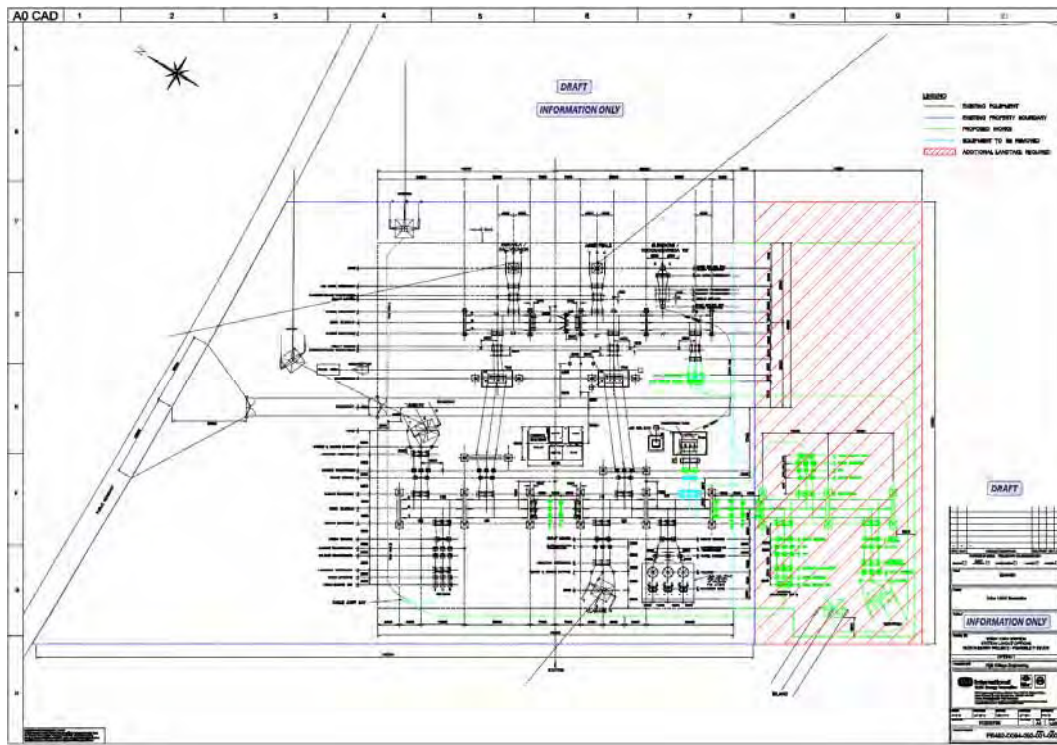
Following consultation with local residents, the following high level options have now been considered.

Option One, is to develop land that is currently available to extend the station towards the R555. (See Figure A.3.1 Preliminary draft only)



**Figure A.3.1** Preliminary Design **Option One** at the existing Trien substation, extension to the north-east.

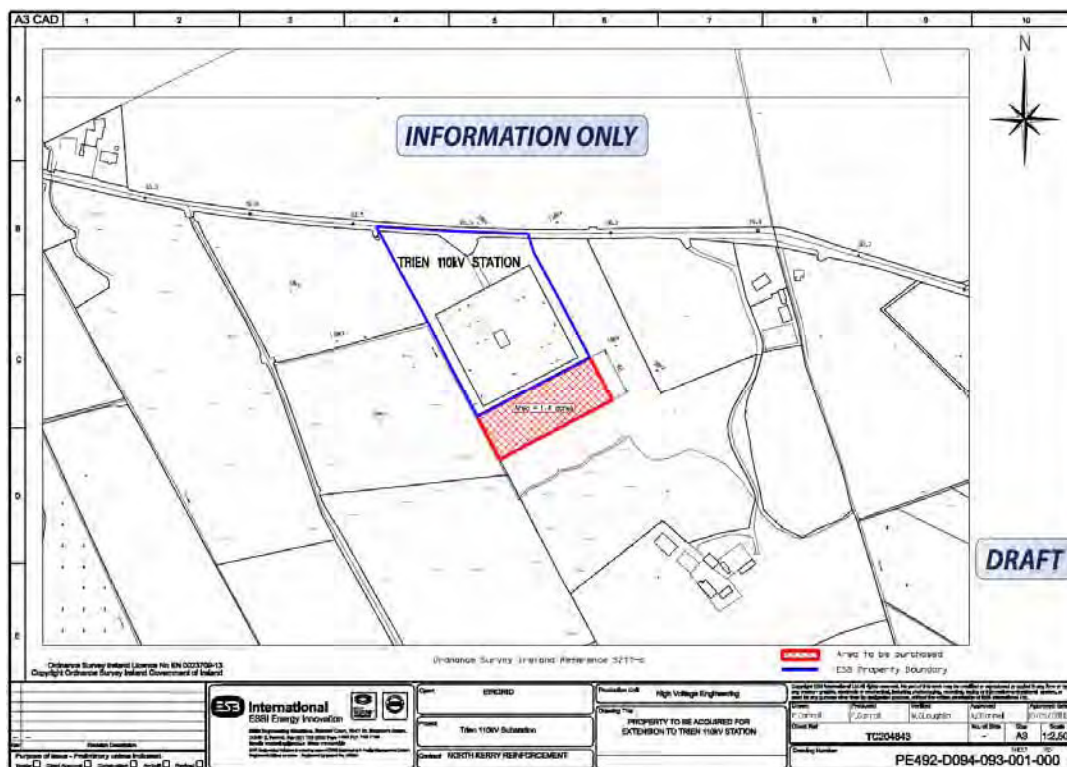
Option Two, is to develop private land to the back (south) of the station. (See Figure A.3.2 Preliminary draft only)



**Figure A.3.2** Preliminary Design **Option Two** at the existing Trien substation south of existing station.

During these modifications a number of local issues may improve the stations local integration.

- (a) The external station alarms (Klaxon) will be relocated to the far side of the control room building and altered to reduce the noise at night. On occasion this is causing some annoyance to local residents.
- (b) The existing entrance to Trien station will be modified to reduce potential for antisocial behaviour in this location. Additional security measures will be discussed with ESB Networks (asset owner) and installed as required.
- (c) Further vegetation and screening may be installed in co-operation with the adjacent landowners. (Agreement is required)
- (d) In order to reduce the height of the new LCIM at Trien from Cloghboola, consideration maybe given to use an OHL to gantry arrangement. This may be looked at further during the Stage two design stage.



**Figure A.3.3** Potential additional land at the existing Trien substation.

*HV Decision Point: At this stage it is proposed to proceed with option 2.*

Fig. A.3.3 shows the potential additional lands for the Cloghboola to Trien connection onto the system. This is subject to local agreement and ongoing co-operation on the NK planning application process. The project team welcome this local feedback and positive engagement on these matters.

### Bord Gáis Transmission Line

There is currently no gas transmission line in this area.

### Natural Constraints

#### A.4 Ecology

TOBIN consulting engineers are undertaking the ongoing ecological aspects of the project. In addition a detailed and specialist ornithological study has been carried out by Natura environmental consultants in 2010 for all corridor options. This breeding and wintering bird survey and assessment, informed this report.

The study area mostly lies within County Kerry and is located to the southeast of Listowel and extends south into the Glanaruddery Mountains. The villages of Kilmorna, Duagh, Abbeyfeale and Knocknagashel feature in the study area. The study area habitats can be broadly summarised as low lying improved farmland in the northern half and low hills in the southern and eastern half. The hilly areas are marginal upland farmland consisting of fragmented upland bog / heath mosaic within a more extensive areas of coniferous forest plantation, rush pasture and improved farmland. The main rivers are the Smearlagh and Feale. The Smearlagh River forms a general western boundary to the study area while the River Feale bisects this area from south east to north west.

The National Parks and Wildlife Services (NPWS) database of designated nature conservation areas was reviewed to identify any designated sites lying within the study area. Sites can be designated for their nature conservation interest under European and Irish legislation. The three principal forms of designation are as follows: SAC, SPA and NHA as detailed above.

Habitat: Recent aerial photography of the study area was reviewed to establish the broad habitats and ecological characteristics that occur within each proposed substation site area and corridor option. A windscreen survey of all the corridor and substation site options, and surrounding study area, was also undertaken to confirm the broad habitats present and to consider the ecological value of the study area in terms of its likely importance to flora and fauna within this study area. Key areas of national and international significance were checked including the River Feale (part of the Lower River Shannon SAC) and Glanaruddery mountains area (part of the Stacks to Mullaghareirk Mountains West Limerick Hills and Mount Eagle SPA). Locally significant ecological features were also checked including areas of heath, bog, rush pasture and woodland.

Birds: Given the importance of the SPA (Code 004161) a detailed ornithological (winter and breeding bird) survey was conducted by Natura Environmental consultants in 2010 to inform the initial route and substation selection process. All Corridor Options would require crossing through the



Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. This area was primarily designated as an important Hen Harrier (*Circus cyaneus*) breeding and foraging site (rated by the NPWS as the most important in Ireland). Hen harriers have been mentioned in some reports (e.g. Northern Ireland Hen Harrier Action plan) as being “*potentially susceptible*” to collision with powerlines. There may also be risks of disturbance to breeding individuals during construction and maintenance phases of the development.

In addition the bird survey report was informed by;

Breeding Bird surveys conducted throughout the study area in 2008 to 2010 inclusive.

- Including winter Bird surveys conducted in late 2010.
- Consultation with local NPWS rangers over the past few years and more recently with its DAU.

Knowledge of bird ecology in the area from previous surveys conducted including the windfarm at Cloghboola.

The following were the key designated sites within the study area and a map showing their position. (Figures A.4.1 & A.4.2)

Designated sites within the Study Area

Name	Designation (Site Code)
Moanveanlagh Bog pNHA	002351
Moanveanlagh Bog SAC	002351
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	004161
Lower River Shannon SAC	002165

**Figure A.4.1** Designated sites within the study area.



**Figure A.4.2** Ecological designations identified within the study area.

Designated Sites and Annex 1 listed Bird Species (Hen Harrier and Merlin)

The emerging preferred corridor should be located at the greatest distance from hen harrier breeding areas. As the southern sections of all six corridor options are relatively close (within 500m) of a probable breeding site, the location of the final alignment will be as far as possible from this area in order to avoid direct impacts to breeding hen harrier.

A range of protected species of note potentially utilise the study area include;

- Pine Marten
- Badger
- Deer Species (Red, fallow and sika)
- Red Squirrel
- Irish Hare
- Smooth Newt (amphibian)
- Common Frog (amphibian)
- Viviparous Lizard
- Otter
- Bat Species (including *Rhinolophus hipposideros* listed in Annex 11 of the *Habitats Directive*)

However, these species are widely distributed. Potential bat roost, badger sett, amphibian breeding sites (ponds, bog and ditches) lizard sites (heath and bog) and otter breeding sites can be effectively avoided largely at the final route selection within the corridor. In summary, effective mitigation can be implemented at the final design and alignment stage to minimise potential direct disturbance to these species.

The overhead transmission line corridors and candidate site areas have been evaluated in terms of the presence of designated sites, key ecological features, and ornithological study and consultation responses.

The designated sites and key ecological features along each Corridor were rated broadly in accordance to the site evaluation scheme contained in the National Roads Authority's Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009).

A meeting with the NPWS DAU was held in December 2010. During this meeting the project was discussed in detail with the NPWS DAU; including



the survey requirements and project approaches, in order to minimise impacts on sensitive ecological receptors, and particularly birds of conservation significance (Hen Harrier) in the SPA. (Code 004161)

Ecological Evaluation	
Internationally Important	<p>Sites designated (or qualifying for designation) as an SAC or SPA under the EU Habitats or Birds Directives;</p> <p>Undesignated sites that fulfil criteria for designation as a European Site;</p> <p>Features essential to maintaining the coherence of the Natura 2000 network;</p> <p>Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive;</p> <p>Resident or regularly occurring populations of birds listed in Annex I of the Birds Directive and species listed in Annex II and/or Annex IV of the Habitats Directive;</p> <p>Ramsar Site;</p> <p>World Heritage Site;</p> <p>Biosphere Reserve;</p> <p>Site hosting significant species populations under the Bonn Convention;</p> <p>Site hosting significant populations under the Berne Convention;</p> <p>Biogenetic Reserve;</p> <p>European Diploma Site;</p> <p>Salmonid water.</p>
Nationally Important	<p>Sites or waters designated or proposed as an NHA*;</p> <p>Statutory Nature Reserve;</p> <p>Refuge for fauna and flora protected under the Wildlife Acts;</p> <p>National Park;</p> <p>Undesignated sites fulfilling criteria for designation as a NHA; Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act and/or a National Park;</p> <p>Resident or regularly occurring populations (assessed to be important at the national level) of species protected under the Wildlife Acts and/or species listed on the relevant Red Data list;</p> <p>Site containing viable areas of the habitat types listed in Annex I of the Habitats Directive.</p>
County Importance	<p>Areas of Special Amenity;</p> <p>Area subject to a Tree Preservation Order;</p> <p>Area of High Amenity, or equivalent, designated under the County Development Plan;</p> <p>Resident or regularly occurring populations (assessed to be important at the County level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed on the relevant Red Data list;</p> <p>Site containing area(s) of the habitat types listed in Annex I of the Habitats Directive that do not fulfil criteria for valuation as of International or National Importance;</p> <p>County important populations of species, or viable area of semi-natural habitats or natural heritage features identified in the National or local BAP;</p> <p>Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county;</p> <p>Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.</p>
Local Importance (higher value)	<p>Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP;</p> <p>Resident or regularly occurring populations (assessed to be important at the Local level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed in the relevant Red Data list;</p> <p>Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;</p> <p>Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.</p>
Local Importance (lower value)	<p>Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;</p> <p>Sites of features containing non-native species that are of some importance in maintaining habitat links.</p>

**Figure A.4.3** Sites evaluation scheme.



While it is intended that the proposed development will have a low impact generally, it is important that the above described habitats in particular are avoided as far as possible and towers sited as much as possible in modified habitats e.g. improved farmland, forestry edge (e.g. along existing access tracks and roads), mature forest etc.

Most of the impacts that can be predicted at this initial stage of the proposed development are associated with the construction phase and permanent modifications to baseline ecology within the works area footprint. Aspects of the proposed development that may impact on ecology may include the following:

- Construction activity including vegetation clearance, site excavation, pole construction and line stringing;
- Temporary access road / track locations;
- Storage of excavated material;
- Noise disturbance from machinery and staff;
- Suspended solids, fuel runoff to drains and other watercourses; and
- Potential disturbance to bird breeding and foraging areas

Cumulative Impacts: The existing transmission system infrastructure within the study area runs adjacent to and in some occasions crosses the following designated sites:

- Clashavoon to Tarbert 220kV line;
- Tarbert to Trien 110kV line; and
- Dromada (Athea) to Trien 110kV circuit.

The habitats within the study area including all designated sites are subject to ongoing diffuse perturbations to water quality from a wide variety of pollution sources (e.g. agriculture, forestry and housing runoff). These issues are beyond the scope of this Report. Appropriate mitigation measures will be put in place to ensure no cumulative impacts are arising as a result of the proposed development within any of the surrounding designated sites.

Each of the ecological receptors highlighted during this report should be considered at the design stage to mitigate as far as possible against potential negative impacts on the ecological integrity of habitats, flora and

fauna present. The most important mitigation at the design phase is the avoidance of designated sites and undesignated sensitive habitats, as far as possible.

Key sensitive habitats should be avoided in the study area which include watercourses and adjacent wetlands / woodlands, mature deciduous woodland, heath and bog habitat, hedgerows, treelines and coniferous forestry (where possible) particularly pre-thicket second rotation plantations. As this list is extensive, some compromise is likely to be needed.

A full ecological evaluation of the intended line route will be implemented as part of an environmental assessment, as required, for the final selected line route option. This will include a detailed flora and fauna survey including protected species and a protected and general mammal survey. It will also include detailed and appropriate mitigation measures as required.

Department of Environment Heritage and Local Government (December 2009) (DOEHLG) guidelines have clarified the requirement for Appropriate Assessment reporting, to consider the possible nature conservation implications of any plan or project which may possibly impact a European Designated (NATURA 2000) Sites which include candidate Special Areas for Conservation (cSAC) and/ or Special Protection Areas for Birds (SPA).

This report details a Screening stage of the Appropriate Assessment process. The aim of this stage is to highlight potential impacts to sensitive ecological receptors in designated sites possibly linked to the proposed development site. See Fig. A.4.2 for sites located in close proximity / within the study area. Sensitive receptors in these sites which may possibly be impacted by this development are therefore considered.

*Decision Point: In conclusion: regarding “sensitive receptors” based on the initial studies and feedback of high level reports; the western corridor option (PINK) has the least potential impact on hen harriers and other birds of conservation concern. All corridor options are potentially within 500m of a known barn owl roost. (Given the proximity to Trien) Further monitoring is nevertheless recommended for these options as nest sites may establish or change before construction. Given the designated status and some residual potential impacts to hen harriers and other birds; site specific mitigation for*

the preferred route will be required, and therefore a NIS is likely to be required. The (PINK) western corridor option is preferred from an overall ecological standpoint including birds.

The candidate station sites will not impact directly on any designated sites, though mitigation will be required during initial site clearance works, and water control and protection measures will be in place during construction.

The initial reports and site visits indicate that at Site Area 4, for the NK station; permanent impacts (if any) are likely to be at most only negligible/slight.

## **A.5 Landscape**

The landscape report was prepared by Chartered Landscape Architects, URS/Scott Wilson. The purpose of the report is to investigate the options for a proposed new NK 220/110kV station, with loop-in of the existing Clashavoon – Tarbert 220kV Line, the Tarbert – Trien 110kV and the Athea (Dromada) – Trien 110kV line. The report also investigates the options for a new electrical circuit between the new Cloghboola 110kV station near Knocknagashel, to either the existing Trien 110kV station in County Kerry or to the proposed new North Kerry 220/110kV station. Both objectives involved an investigation of the landscape within the study area and an examination of the relationship between the proposed corridor options and the substation site area within the existing landscape setting.

Again, the study area is mainly located in northern County Kerry with a small part lying in County Limerick and is indicated on Figure A.5.1 Visual units within the study area have been broadly defined and described in the Landscape Character Assessments carried out for the Electoral Areas of Listowel and Tralee. This general landscape description summarises the general character of the landscape within the study area.

The landscape character is primarily determined by the undulating pattern of hills, small mountains and river valleys with a flatter plain extending east and north of Listowel in the northern part of the study area. The Glanaruddery Mountains and their foothills are separated by a number of river valleys including those of the Rivers; Smearlagh, Feale, Allaghaun, the

Owveg, the Oolagh, the Galey and to a lesser extent, the Glena and the Tullaleague.

Scenic Views: The following views and prospects are indicated in the relevant maps of the KCC Development Plan, which have been described and numbered below and are mapped on the project constraints maps.

1. Along the local road from Duagh Cross Roads to the townland of Lacka West

View: East towards the foothills of the Glanaruddery Mountains

2. Along the R555 between the townland of Inchymagilleragh and the village of Duagh

View: Northeast across the River Feale and towards Knockathea Hill and foothills further west including the hill and church in the townland of Lissaniska

3. Along the R523 in the townland of Shanacool

View: South across the River Feale and northeast towards the hill and church in the townland of Lissaniska

4. Along the local road between the townland of Lacka East and Rathoran Bridge

View: Southwest across the River Feale valley and towards the foothills of the Glanaruddery Mountains

5. Along the local road between the townland of Derrindaff and Toor

View: South and southwest across the Smearlagh River valley and towards the Glanaruddery Mountains

6. Along the local road in the townland of Knockaunbrack

View: West across the Smearlagh River valley

It should be noted that the views listed above are often *intermittent and obscured* by existing roadside vegetation, scattered residential housing,

farm and farm buildings. Most of the scenic views take in an agricultural and inhabited man- altered landscape; including on occasion existing overhead lines, wind farms, and new housing.

The following former demesne sites have been identified within the study area. Their level of intactness is described in the National Inventory of Architectural Heritage and listed below. They are mainly located within the vicinity of Listowel and within the River Feale valley, south and southeast of Listowel:

- Kilmeany House - Virtually no recognisable features remaining.
- Duagh House - Virtually no recognisable features.
- Duagh Glebe House - Virtually no recognisable features.
- Ballinruddery House - Main features unrecognisable - peripheral features visible.
- Ballygrenane House – No information available



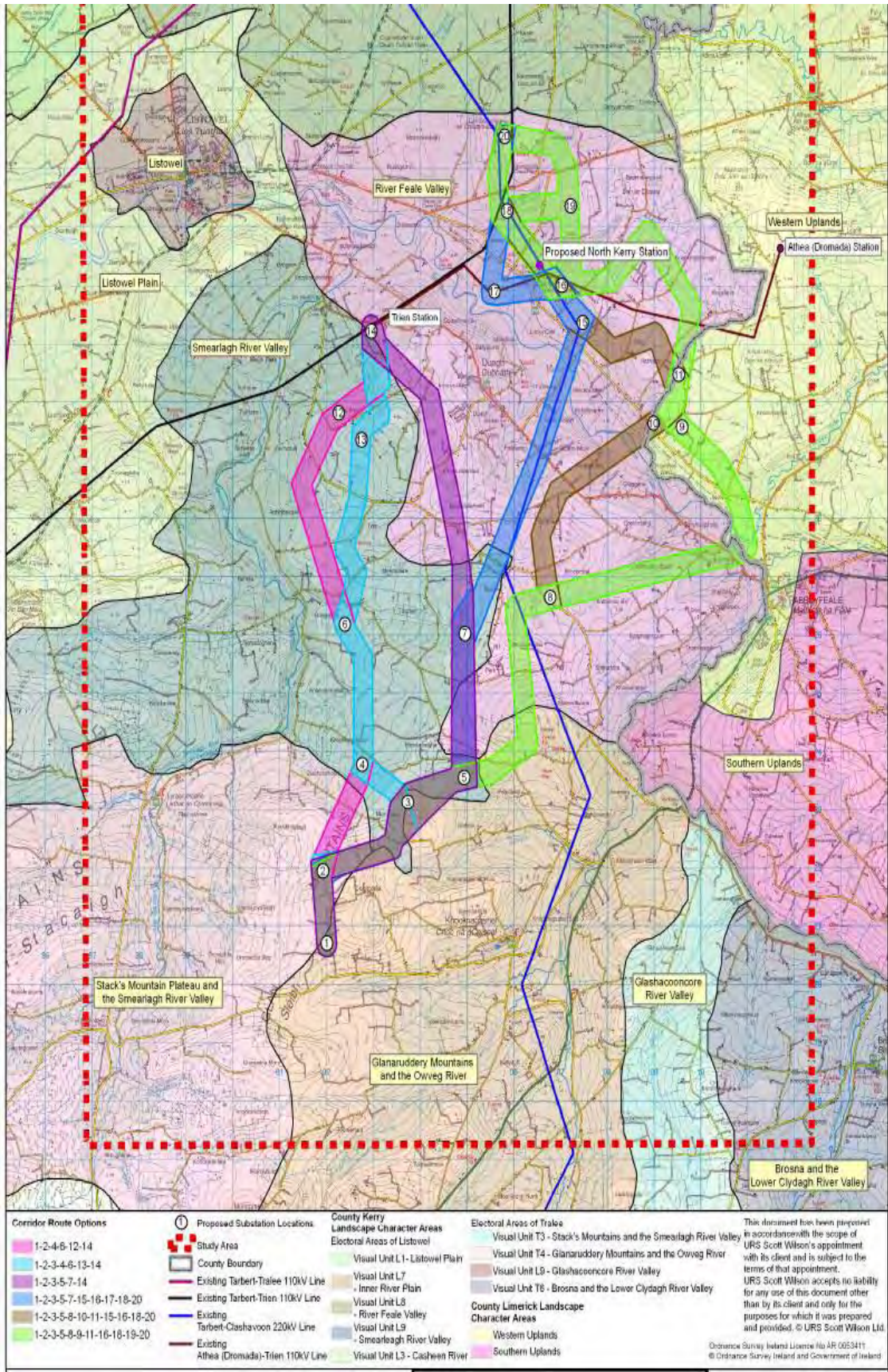


Figure A.5.1 NKP General landscape classification units.

Landscape recommendations: The assessment regarding the preferred substation site area options is based on established methodology, the analysis and potential screening opportunities and observations during the site surveys. The potential landscape and visual impact arising from both the siting of the substation and the length of new overhead transmission lines required to loop in the existing Tarbert - Trien 110kV line, the Athea (Dromada) - Trien 110kV line and the Clashavoon -Tarbert 220kV line, have been taken into account.

The NK 220/110kV substation site option 4 is the emerging preferred area in terms of minimising landscape and visual impact for the following reasons described below:

- Opportunities for screening due to existing mature woodland planting and hedgerows in close proximity;
- Minimal length of new transmission lines required to connect with existing lines;
- In terms of siting, the location falls within 2km of a protected viewpoint, the minimal length of connection required minimises the potential impacts on scenic views within the wider study area;
- Potential for interconnecting lines to cross the River Feale minimised ;
- Potential for connecting lines crossing ridgelines minimised;
- Minimises visibility of substation and lines against the skyline;
- and
- As indicated in the County Kerry Landscape Character assessment;

The Site option no 4 is within Landscape Character Unit L8 – River Feale Valley and within Physical Unit Type C – Pasture with mature hedgerows – Variant IV, which has been classified as “moderately sensitive”.

Visual impact can be reduced by careful siting and design of the substation to take advantage of the screening effects of existing vegetation; local topography and the establishment of additional screening vegetation. While these locations are within the 2km viewshed of a scenic view, the viewing distance of 2km and intervening vegetation would result in little chance of any significant visibility.

These locations provide an opportunity to minimise the length of transmission line required to connect with the proposed substation site. While some of the alternative potential substation area options are outside of the viewshed of some scenic routes, the distance from one, two or all existing overhead transmission lines requires longer lengths of connecting overhead transmission lines which would result in greater landscape impacts and a requirement to cross additional ridge lines.

*Decision Point: Overhead line corridor options: The emerging preferred corridor options are the western corridors (PINK). The potential landscape and visual impacts could be minimised by locating the proposed OHL along the western edge of the Corridor Option PINK:*

At this stage the following conclusions and recommendations can be made:

In terms of minimising potential landscape and visual impacts, Corridor Options PINK and PURPLE are the emerging preferred Corridor Options. Appropriate project design and mitigation measures can be undertaken to ensure this route avoids sensitive viewsheds of scenic views and close proximity to clusters of settlements. It avoids the vicinity of the Smearlagh River valley and the final line route can be located away from hill tops and therefore visibility against the skyline can be minimised.

Corridor Option LIGHT BLUE is the next preferred Corridor Option. Potential impacts could be minimised by locating the proposed overhead transmission line along the western part of the proposed Corridor Option and in taking advantage of screening provided by existing vegetation.



Corridor Option	Reasons	Residual Impact
<b>Pink</b>	<ul style="list-style-type: none"> <li>• Does not cross the Feale Valley</li> <li>• Visibility against the skyline can be kept to a minimum</li> <li>• Opportunity for mitigation by availing of woodland screening and avoidance of direct impacts on sensitive features</li> <li>• Passes through 1km viewsheds of two scenic views and prospects</li> <li>• Passes in proximity to the Smeafagh River valley</li> <li>• Does not traverse a Physical Unit of Special Sensitivity</li> </ul>	Low

**Figure A.5.2** Landscape summary evaluation and emerging preferred Corridor option PINK.

## **A.6 Soils and Geology**

ESBI Engineering was appointed to provide the soils and geology inputs, to the initial constraints assessment, route selection and subsequent environmental assessment for the North Kerry Project.

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.

This assessment was undertaken with reference to the Institute of Geologists of Ireland Guidelines – Geology in EIS (2002). These guidelines identify the following geological issues to be potentially significant with regard to the assessment of linear projects, such as electricity overhead lines (Project type 20) including:

- Nature of rock/soil

- Impact on groundwater
- Impact on Geological Heritage
- Impact on Natural Resources e.g. resource sterilisation

Soils: Therefore, the preferred station and corridor location/corridor would maximise the presence of glacial till and minimise the presence of peat and rock, so as to maximise the ease of construction and minimise potential environmental impacts.

More detailed analysis will be undertaken in the next stage of the project once the zone's and detailed routing become more defined. (See figure A.6.1)



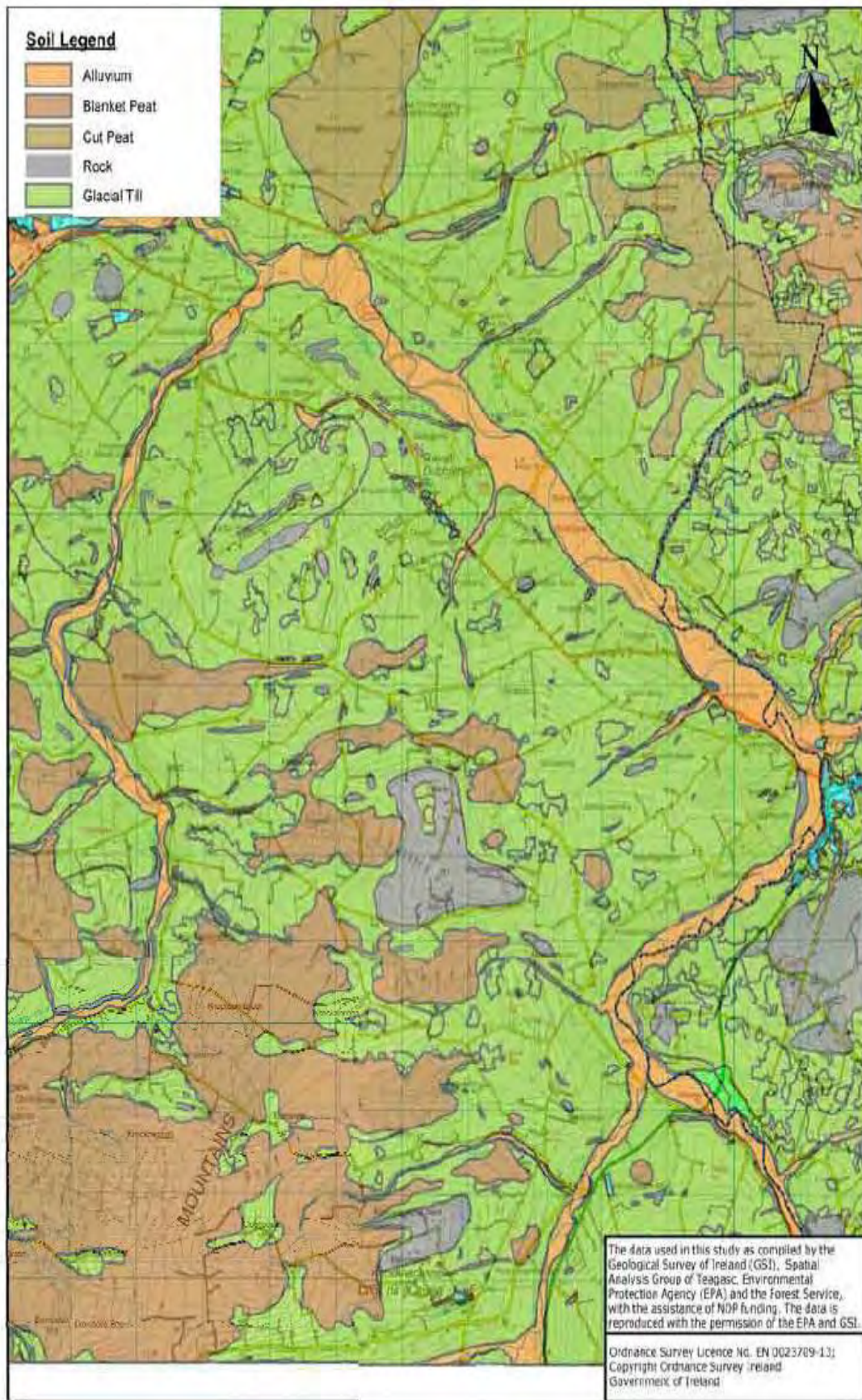


Figure A.6.1 Soil and Geology analysis mapping for the study area.

Soil/Geology Decision Point: Initial recommendation: There are no soil, geology or groundwater constraints identified by this initial study that would prevent or significantly inhibit the development of the North Kerry 220/110kV project in this study area.

Given the large study area, slope stability has not been fully assessed in this preliminary study and geotechnical investigation along the preferred overhead line route, and at the new NK station site when known, will be required. A peat landslide (peat flow) is recorded at Ballincollig Hill, several kilometres to the west of the study area.

It was recorded that there was an issue regarding crossing some blanket peat in the southwest of the study area to reach the windfarm station at Cloghboola. It is not expected that the NKP will impact on peat however in advance of planning submission; the NK development will be fully evaluated along either the OHL or UGC route and at the selected station site.

## **A.7 Water**

The water report was prepared by ESBI Environmental group. 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 are imperceptible during both the construction and operational phases.

All route corridors and sites are located in the catchment area of the Feale River in Hydrometric area 23. The project area is located in the catchment area east of the Smearlagh river tributary and the Feale River itself.

The bedrock, soils and subsoils indicate that the study area comprises primarily: A locally important aquifer which is moderately productive only in local zones low permeability subsoil, or in some areas, no subsoil Blanket peat, located on the hills to the south.

Initial discussions with Inland Fisheries Ireland (IFI) (Shannon Basin Division):

North Kerry 220/110kV station site:

- Fish stock count requested on tributary stream to south of emerging NK station site.
- Biological Q assessment to be undertaken on tributary stream.
- Construction phase sediment traps to be designed with sufficient retention time to mitigate suspended solid to stream.
- On completion, clean surface water from the NK substation could be diverted directly to the stream.
- Bunded areas surface water to be directed to interceptor.
- Protection: Advanced weather forecasting to be used to identify suitable periods for works.

There are no particular constraints associated with any of the options for the North Kerry Substation.

Cloghboola U/G cable connection:

- Silt traps will be required where laying underground cables to control any sediment.
- Fish stock sampling requested on tributary streams crossed by the any proposed underground cable connection.
- Biological Q assessment to be undertaken on tributary streams crossed by the proposed cable connection where applicable. Small Streams Risk Assessment to be used where Q value inappropriate.
- Any in-river works (such as cable trenching) to be confined to the period May – September inclusive and preferably in June.
- Spawning gravels (where present in consultation with IFI) to be removed at construction location for in-river works and replaced post construction.
- Restoration of any bank side damage through mitigation measures for bank erosion such as placement of rock armouring post construction and reseeded with suitable vegetative cover.
- Advanced weather forecasting to be used to identify suitable periods for works. (near streams)
- Multiple sediment traps such as geo-textile membranes should be used to control sediment on streams to rivers and for in-river works to facilitate sediment removal.

- Assessment of erosion stability of agricultural lands, especially where peat based, post cable lay required.

Conclusion: There are no particular constraints associated with any of the emerging options proposed for the North Kerry Substation. If an underground cable is proposed rather than an OHL, specific route evaluations will then be required. Peat (structure, type, depth, slope, saturation, stability etc.) at some locations depending on site locations they will need to be evaluated further, specifically in terms of stability, particularly where excavated and stored, as this could potentially lead to increased organic particulate loading of waters. This will require specific geotechnical risk assessment. Decaying brash from forest clearfell could potentially pose a nutrient problem.

The western corridor options such as PINK would require less forest stand removal in its northern section and would be marginally preferable as a route.

Route corridors DARK BLUE, BROWN and GREEN would have similar impact potential but have the added complexity of crossing the Feale River itself, which is a candidate Special Area of Conservation, with higher potential risk from construction activity related to structures to support the crossings.

In conclusion, the preference is for the western corridor option. In certain areas UGC is preferable to clear felling of trees. However further detailed consultation is required here with the relevant authorities during the next stage of the project. EirGrid and it's consultants are in contact with the relevant organisations such as IFI, regarding local streams, mitigations and assessing project construction activity and the control measures.

## A.8 Appendices

Due to the large amount of detailed maps and data contained within this report, they are available separately on the project website or on request from EirGrid: ESBI/OSi Copyright Mapping Note: 'This Project is being proposed by EirGrid plc, the Transmission System Operator and will be owned by ESB the Transmission Asset Owner.'

- These can be viewed and downloaded from the project website, <http://www.eirgridprojects.com/projects/northkerryproject/overview> or
- Alternatively they can be requested from the project team at the contact details below:

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## A.9 Acknowledgements:

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We would like to thank members of the local community for attending the project open days and their assistance in facilitating these events. Sincere thanks also to local landowners, An Bord Pleanála, NPWS (local rangers and managers), Inland Fisheries Ireland, An Taisce, NPWS DAU, and Kerry County Council for their support of EirGrid's, North Kerry project.



## Report Abbreviations:

AIS Air Insulated Switchgear (type of HV station design)

CH Cultural Heritage (archaeological or historical feature or site)

CDP County development plan

DC Double Circuit (two circuits on one structure)

ED Electoral District (boundary demarcation)

EMF Electric and Magnetic Fields

GIS\* Geographic Information Systems. (map and data information system)

GIS Gas Insulated Switchgear (type of HV substation design)

HH Hen Harrier (Annex one protected bird)

HV High Voltage (110kV and 220kV)

IFI Inland Fisheries Ireland (Shannon Basin)

IPP Independent Power Producers (i.e. 3<sup>rd</sup> party electricity generation)

KCC Kerry County Council

kV Kilovolt (1000 Volts)

LC Lead Consultant (ESB International)

LCC Limerick County Council

LCIM Line- Cable Interface Mast

LV/MV Low voltage / Medium Voltage (e.g. 10kV, 20kV and 38kV)

MO Market Operator

NDP National Development Plan

NHA Natural Heritage Area

NIS Natura Impact Statement

NK North Kerry (Southern Ireland, area within County Kerry)

NKP North Kerry Project

NPWS National Parks and Wildlife Service

NPWS DAU (Development Applications Unit) Regional based at HO

OHL Overhead line (High Voltage power lines suspended above ground)

RPG Regional Planning Guidelines

SAC Special Area of Conservation (ecological protected area)

SC Single Circuit (one circuit on one structure unlike DC above)

SID Strategic Infrastructure Development

S/S substation

SPA Special Protection Area (ecological protected area)

TL Townland

U/G Cable reference: Under Ground Cable

UGC Underground Cable

W/F Windfarm

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