

1 NON-TECHNICAL SUMMARY

1.1 INTRODUCTION

This is the Non-Technical Summary of the Environmental Impact Statement that has been prepared in response to a Further Information Request received by EirGrid from An Bord Pleanála on the 29th April 2013.

The Environmental Impact Statement sets out a description of the proposed development, an outline of the main alternatives studied by the developer (and an indication of the main reasons for this choice taking into account the effects on the environment), a description of the potential effects of the proposed development on the environment, a description of the data required to identify and forecasting methods used to assess the potential effects on the environment referred to above, a description of the measures envisaged to avoid, reduce and, where possible, remedy significant adverse effects on the environment and a description of the residual impacts, if any.

The EIS has been prepared having regard to all relevant EU and Irish Legislation and Guidance including recently published EU guidance relating to Integrating Climate Change and Biodiversity into Environmental Impact Assessment.

In addition, the Environmental Impact Statement addresses the concerns identified in the Stage 1 Lead Consultants Report (May 2011), which was carried out for the project and identified the most significant constraints within the study area, and in the Stage 2 Lead Consultants Report (February 2012), which considered the emerging preferred route corridor. The Environmental Impact Statement also addresses issues raised in submissions received during the scoping process (see below). Scoping was informal and is in accordance with the EU and EPA Guidance.

The potential impacts of the operation and construction phases of the proposed development have been assessed and summarised under the following environmental topics:

- Human Beings and Population
- Landscape and Visual Impact
- Cultural Heritage (including architectural and archaeological heritage)
- Ecology (including fauna and flora)
- Soils and Geology
- Water (Hydrology and Hydrogeology)
- Material Assets
- Air and Climatic Factors
- Inter-relationship of the foregoing factors

Mitigation measures have been integrated into the project with a preference given to measures that avoid potential environmental effects over measures that reduce and, where possible, remedy potential environmental effects.

Assessments were carried out on the basis of available access and information, i.e. on the basis of conditions that could be reasonably viewed or inferred from aerial photography, published reports and direct observation during site visits.

Consultation on the contents of the previous Environmental Report and this EIS was carried out by the Lead Consultant and the specialists. Letters advising prescribed bodies and other interested parties that an EIS was being prepared were sent out and these letters requested input regarding the project. All of the feedback from the prescribed bodies, landowners and other parties was considered.

All distances are measured from the centre line of the overhead line and from the compound fence of the substations.

1.2 THE PROJECT

1.2.1 PROJECT DESCRIPTION

The proposed Laois-Kilkenny Reinforcement Project consists of the following inter-related units:

- Unit 1: New 400/110kV GIS substation at Coolnabacky townland, Co. Laois.
- Unit 2: New connection to Coolnabacky from the existing Moneypoint-Dunstown 400kV line (c. 1.4km).
- Unit 3: New 110kV connection to Coolnabacky substation from the existing Athy-Portlaoise 110kV line.
- Unit 4: A new 110kV / 38kV / MV substation in Ballyragget, Co. Kilkenny.
- Unit 5: A new 110kV overhead line between Ballyragget and Coolnabacky (c. 26km).
- Unit 6: An Uprate of the existing Ballyragget-Kilkenny 110kV overhead line (c. 22km).
- Unit 7: A New Bay in the Existing Kilkenny 110kV station.
- Unit 8: Modifications to existing Athy-Portlaoise 110kV line.

It should be noted that EirGrid as the Transmission System Operator (TSO) are responsible for obtaining planning consents. ESB as the asset owner are responsible for construction and maintenance of the development and for that reason documents relating to ESB are referenced in this EIS from time to time.

1.2.2 TEMPORARY WORKS FOR CONSTRUCTION OF OVERHEAD LINES

1.2.2.1 Construction Material Storage Yard

The construction yard for the overhead line elements of the project will be the existing ESB storage yard at Killeel, Co. Kildare and all deliveries will be by way of just-in-time deliveries.

1.2.2.2 Stringing Areas including Crossings over Public Roads

Stringing of overhead lines refers to the installation of the phase carrying conductors and shieldwires on the supporting structures or towers. The conductor is kept clear of all obstacles along the straight by applying sufficient tension. Certain obstacles along a straight have to be guarded such as road/railway crossings and other transmission or distribution lines by way of temporary guard poles

1.2.3 CONSTRUCTION METHODOLOGY

Prior to commencement of works the contractor(s) will prepare a Construction and Environmental Management Plan (CEMP) which will include method statements and work programmes that show more detailed phasing of work however it will reflect the proposed works and mitigation measures detailed and assessed herein. The Construction and Environmental Management Plan produced by the contractor(s) will be agreed with the appropriate authorities. ESB Networks, who are responsible for constructing the proposed development, will employ a team to monitor the construction phase of the project and ensure works are being carried out in accordance with the agreed method statement, safety procedures, pollution control etc.

1.2.3.1 Substation Construction Works

Two new substations (Coolnabacky 400/110 kV substation and Ballyragget 110 kV /38 kV / MV Substation) and changes to the existing Kilkenny 110 kV substation are proposed.

For the two new substations the following is proposed:

Main Construction

- Site establishment and site compound;
- Station entrance from the public road network;
- Station access road;
- Site clearance, earthworks & Sustainable Drainage Systems (SuDS);
- Existing OHL enabling works;

- Predominantly stone surfaced compound area with security fencing;
- Compound circulation roads;
- 400 kV GIS building;
- 110 kV GIS building;
- 38 kV GIS building in Ballyragget;
- Enclosed structure housing segregated electrical transformers;
- Miscellaneous outdoor electrical equipment, cabling and wiring with associated support structures and bases;
- Site services including surface water drainage, foul water drainage and water supply;
- Paving, fencing and external finishes;
- Landscaping; and
- Dismantling of existing 38 kV / MV substation.

Electrical Installation

- Delivery and installation of transformers;
- Delivery and installation of all other HV equipment;
- Wiring and cabling of HV equipment and protection and control cabinets; and
- Commissioning of all newly installed equipment.

For the duration of the construction phase of the substations there will be temporary welfare facilities installed. Traffic management plans and waste management plans will be implemented.

All works will be carried out in accordance with the Building Regulations and up-to-date design codes at the time of mobilisation. There are no construction activities planned which could be considered abnormal or complex in the context of civil and building construction projects.

For the existing Kilkenny 110 kV substation the following is proposed:

Main Construction

- 110 kV modification works, including AIS substation works as per drawings and structural steelwork erection;
- Fencing; and
- Completion works, full reinstatement of lands.

Electrical Installation

- Delivery and installation of all other HV equipment;
- Wiring and cabling of HV equipment and protection and control cabinets; and
- Commissioning of all newly installed equipment.

A traffic management plan will be implemented and a waste management plan will be implemented.

1.2.3.2 Overhead Line Construction

The construction techniques carried out will be in line with international best practice and fully comply with all health and safety requirements. In general the construction phase can be broken down into the following parts:

- Verify that all planning and environmental conditions have been satisfied;
- Carry out pre-construction site surveys including access review and ground conditions;
- Delineation of any on-site working area (e.g., erection of temporary fencing);
- Setting out of tower foundations;
- Site preparation works including minor civil works such as removal of fences and erection of temporary fencing;
- Where necessary, removal of hedges and trees;
- Installation of tower foundations;
- Erection of towers and polesets; and
- Stringing of conductors and commissioning.

The proposed 400 kV line will consist of galvanised steel lattice towers of varying heights at intermediate and angle locations. The proposed 110 kV line will be constructed of double wood polesets at intermediate locations and galvanised steel lattice towers at angle positions. This style of construction is the standard type of construction used for 400 and 110 kV lines in Ireland.

1.2.3.3 Installation of Underground Cable

All the connections into the 110 kV substations for the Laois – Kilkenny reinforcement project are by way of underground cable for short distances from cable interface masts close to the 110 kV substations. The works proposed are as follows:

- Excavating the Trench;
- Installing HDPE Ducts in the Trench;
- Backfilling Trench; and
- Power Cable Installation.

1.2.4 WORKING HOURS

Site development and building works will generally be carried out during normal working hours. In exceptional circumstances works may be required outside of these hours.

1.2.5 WASTE MANAGEMENT

All waste arising during the construction phase will be managed and disposed of in accordance with the relevant legislation.

1.2.6 REINSTATEMENT OF LAND

Once all works are complete, the access route and the construction areas around the overhead line structures are restored to their original condition.

1.2.7 COMMERCIAL FORESTRY AND HEDGING

The proposed new Ballyragget – Coolnabackey line crosses commercial forestry. The normal corridor widths centred on the line to be left clear of trees for 110 kV lines is 61 metres.

Hedges need to be managed under powerlines. All trees must be outside their falling distance from any part of any overhead line support.

1.2.8 CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

In the event that An Bord Pleanála grants approval for the proposed development, a Construction Environment Management Plan (CEMP) will be prepared addressing the mitigation measures that have been assessed in this EIS and any other issues specified by An Bord Pleanála and will be agreed with the planning authorities.

1.2.9 MAINTENANCE

The lifespan for all the units of the development is expected to be 50 to 60 years. During this lifespan of the units there will be on-going maintenance on the different units. The routine maintenance within the substations will be contained to the substation site and no environmental impacts are envisaged.

1.2.10 DECOMMISSIONING

The expected lifespan of the development is in the region of 50 to 60 years. In the event that part of, or, the entire proposed infrastructure is to be decommissioned, all structures, equipment and material to be decommissioned will be removed and the land reinstated.

1.2.11 HEALTH & SAFETY

ESB Networks who will be responsible for constructing the line, have policies, procedures and systems in place in the unlikely event of an accident or emergency incident occurring during the construction and lifetime of the development.

1.3 ALTERNATIVES

1.3.1 INTRODUCTION AND PROCESS FOR CONSIDERING ALTERNATIVES

It is a requirement of the EIA process that alternatives considered during the development of the project are described and the main reasons for choosing the proposed development are set out. The consideration of alternatives is a fundamental aspect of environmental appraisal for any transmission infrastructure. The appraisal is an iterative process which follows a structured process as follows:

- Alternative options of achieving the objectives of the project are identified at a technical level;
- Following identification of a preferred project solution at a technical level, a study area is identified;
- Within the study area a number of alternative substation locations and overhead line (OHL) and/or underground cable (UGC) route corridors are identified and assessed having regard to the constraints identified therein;
- Based on the assessment an emerging preferred substation site and an emerging preferred route corridor emerges;
- The emerging preferred substation site and emerging preferred route corridor are then reviewed in respect of feedback received during the consultation phase;
- A preferred substation site and preferred route corridor are identified;
- A preliminary substation design is determined for the site and an indicative line route is designed within the preferred corridor; and
- Finally, a substation is designed for the preferred site and the loop-ins to the substation are finalised.

1.3.2 PROJECT NEED

The Laois-Kilkenny Reinforcement Project is required to address forecasted constraints on the existing transmission network in the Midlands Region, South East Region and County Kildare (referred to as the Area of Concern (AOC)). In assessing the technical need for reinforcement of transmission infrastructure in this area, two issues were identified and each of these is addressed by the project;

- Ensuring security of supply; and
- Improving quality of supply.

Quality of supply is a collective term for many performance issues affecting the transmission system, including issues relating to low voltages, increased potential for fluctuation in voltage (or voltage dips) and a proximity to voltage collapse, which ultimately lead to complete loss of electricity supply.

From a transmission network perspective, security of supply is concerned with maintaining continuity of electrical supply to consumers. As such, it is taken to mean the ability of the transmission network to reliably transport electrical energy from where it is generated to the demand centres where it is consumed.

Although the proposed infrastructure will specifically span between County Laois and County Kilkenny, it will address and alleviate security of supply and quality of supply concerns in the wider Area of Concern, including the counties of Carlow, Kildare, Kilkenny, Laois and Wicklow.

1.3.3 TECHNICAL ALTERNATIVES

To address issues of quality and security of supply four reinforcement options were compared by considering their relative performance from a technical and economic perspective. A high-level

environmental assessment was done to ensure that each of the options would be feasible from an environmental perspective (refer to the Stage 1 and Stage 2 Lead Consultant's Reports that accompany the application).

All the options that were considered were designed to meet the technical needs of transmission reinforcement in the Area of Concern, however the selected option was preferred as it performed well from an economic and efficiency perspective and it involved the least new circuit length and adds the greatest amount of spare network capacity for future growth.

1.3.4 ALTERNATIVE TECHNOLOGY

Alternative technologies for the project components were considered taking into account, inter alia, environmental factors. The alternatives which were selected through this process included:

- Gas Insulated Switchgear (GIS) technology for the new 400/110 kV substation;
- An overhead line solution with very short lengths of underground cables at the 110 kV substation connections for the 110 kV circuits; and,
- A 400 kV double circuit overhead line for the connection from the proposed Coolnabackey 400/110 kV substation to the existing Moneypoint - Dunstown 400 kV line.

1.3.5 ALTERNATIVE SUBSTATION LOCATIONS

1.3.5.1 Substation Study Areas

As part of the Stage 1 Lead Consultants Report, a study was carried out to assess the suitability of potential 400/110 kV substation study areas. This study was requested during consultations with a local community group. EirGrid was asked to consider an alternative location at Cullenagh for the proposed substation study area. The subsequent report examined four potential study areas including Cullenagh, Abbeyleix, Cashel and EirGrid substation study area.

The four substation study areas were assessed under technical, environmental and other relevant criteria.

The originally proposed substation study area, as proposed by EirGrid, was deemed to be the most suitable location having regard to physical, environmental, technical and social factors associated with the type of development proposed and the inherent suitability of the receiving environment to accommodate same. On completion, the findings of this report were then relayed to the local community group (refer to the Stage 1 and Stage 2 Lead Consultant's Reports that accompany the application).

1.3.5.2 Substation Locations

Following identification of the study area and mapping of constraints, nine suitable land parcels within the study area were identified as being potentially suitable in which to site the planned substation, primarily comprising those which avoided identified environmental and other constraints to the optimum extent.

The conclusion of the Stage 1 Lead Consultants Report was that, of 9 no. originally identified potential sites, the substation Site 4 emerged as the optimum site to meet the requirements of this project whilst having the lowest potential environmental impact on the receiving environment.

1.3.6 ALTERNATIVE OVERHEAD LINE ROUTE CORRIDORS

The environmental and other constraints identified within the project study area were used to assist in identifying possible route corridor options between the two substations (being the planned new 400/110kV station and the existing Ballyragget substation); Western, Central and Eastern Corridors were considered.

Even though each corridor option was initially considered by each environmental discipline in isolation, all identified the central corridor as being the most suitable. It should be noted that as per EirGrid's Project Development and Consultation Roadmap, no decision was made in this regard at that stage of project

development; rather the findings of the Stage 1 Information Gathering stage form the basis and focus for public and stakeholder consultation and engagement.

In this regard, following this Stage 1 evaluation, the emerging preferred corridor and associated Stage 1 report were issued to all stakeholders for consideration and feedback in May 2011.

During Stage 2 of the roadmap process, all corridor options were re-evaluated again in light of modifications made. EirGrid concluded that the preferred corridor remained the emerging preferred corridor as previously identified in Stage 1, with the two minor modifications described above.

Thus by the end of Stage 2, a preferred corridor had been identified that on balance, generally avoids the constraints identified as far as is reasonably practicable.

Following confirmation of the preferred route corridor the next step in EirGrid's "roadmap" process, is the identification of a feasible line route within that corridor. The most significant constraint here is generally the avoidance of houses and other constraints that the corridor itself has not been able to avoid given its 1km width (e.g. river crossing), or that encroach into the corridor boundary. The line route identification process generally occurs in the context of direct landowner engagement where possible (and which has generally occurred in this instance), and on site surveys and assessment. This process continues up to the submission of the application for the proposed development.

The overhead line route selection process attempts to generally avoid many changes of direction, which in turn minimises the number of steel angle towers required, and maximises the number of straight runs supported on the wood polesets.

The preliminary indicative overhead line route is set out in the Stage 2 Report and is seen reproduced in Figure 1.1 below.

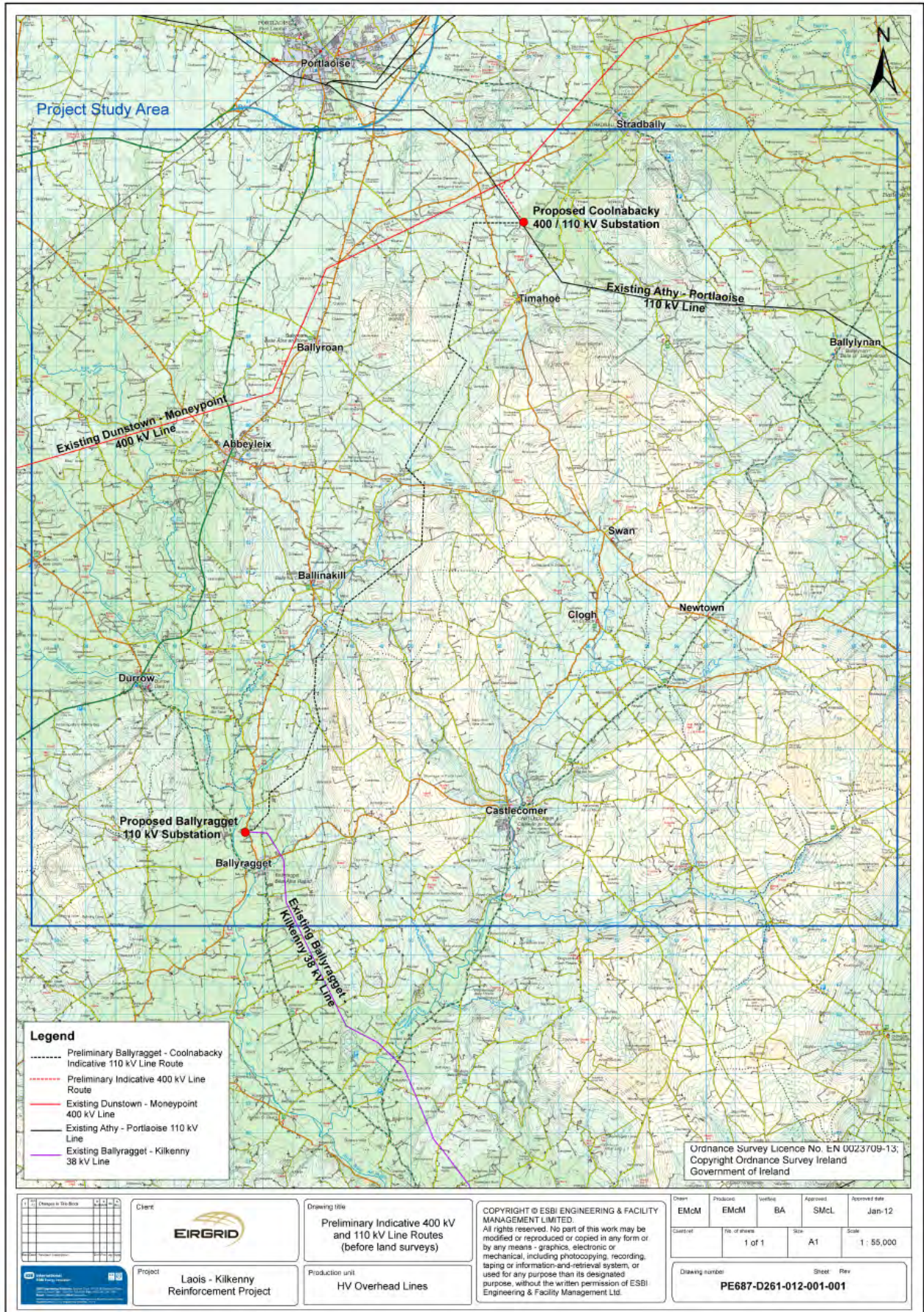


Figure 1.1 Preliminary Indicative Overhead Line Route (as presented in Stage 2 Report)

1.3.7 AMENDMENTS TO INDICATIVE LINE ROUTE

Following feedback from landowners and from EirGrid's environmental consultants, and as a result of landowner engagement, walkover and desktop studies, a number of localised modifications were made to the initial indicative 110 kV line route issued to the landowners. The majority of the modifications are only moves of a few metres and were suggested by either the environmental specialists or the line route designer to improve upon the original indicative line route. Other modifications were suggested by the landowners, some of which were significant and EirGrid's environmental consultants were requested to review these further.

At the time of publication of the Stage 2 report, only angle tower locations (used where the line changes direction and the structures that therefore actually determine the alignment) were identified - intermediate poleset locations had not been determined. Where landowners did not consent to environmental consultants entering lands to carry out surveys, some angle masts have been placed on improved grasslands with less ecological value than hedgerows.

Stage 3 appraised in more detail the previously identified route for the OHL. Refinements to the OHL generally arose as a result of the engagement process with landowners and other directly affected parties. Where possible, requests for changes were accommodated.

1.3.8 CONCLUSION

As a result of the iterative project development process and having regard to careful consideration of alternatives, a final project solution emerged and is the proposed development which is subject of the application for planning approval.

1.4 HUMAN BEINGS AND POPULATION

This section of the EIS provides an assessment of the route for the proposed development under the heading of Human Beings and Population.

The proposed project traverses a region that has experienced continued population growth over the decade. The route is proximate to the towns and villages of Abbeyleix, Ballinakill, Ballyragget and Ballyroan. The route has, in the main, avoided centres of population.

Economic activity in the general area is based principally around agricultural activities with urban related economic activity occurring in Portlaoise and Kilkenny City. To continue to attract investment (both domestic and foreign) and to support agricultural and rural enterprise, physical infrastructure (including energy, broadband, and transport) will continue to play a key role.

In addition to the urban areas of Laois and Kilkenny, which have buildings and features of tourism interest, local amenities near the proposed route include; heritage towns, scenic landscape, scenic routes, significant tree groups, high amenity zones, outdoor activities, forestry, rivers and lakes.

There are no significant constraints in relation to Human Beings and Population. The implementation of appropriate mitigation measures (as described in the sections on Ecology, Landscape and Visual Impact and Cultural Heritage) will ensure there will be no significant residual impact on the environment from the proposed development with regards to Human Beings and Population.

The Electric and Magnetic Fields (EMF) produced by transmission lines in this project will all be below the limits as specified by the relevant bodies.

1.5 LANDSCAPE AND VISUAL IMPACT

The renewal of the line south of Ballyragget will give rise to a localised increase in the intensity of the established effect of the existing 110kV line.

The project will give rise to significant localised changes to the appearance of the immediate vicinity of the substation at Ballyragget.

North of Ballyragget, the project will cause localised changes that will be intermittently visible from roads close to the development, with limited impacts on the wider landscape. Visibility against the skyline will be very localised on account of topography and vegetation, particularly from the R 432, the environs of Ballinakill or Haywood Demesne.

North of Ballinakill, the route crosses some elevated areas that will give rise to some skyline views – affecting small numbers of houses or roads. There will be localised effects around Boleybeg Cross Roads after which the route crosses elevated and afforested lands that contain low levels of roads or dwellings. There will be no significant landscape or visual effects on the historic settlement of Timahoe or its environs.

In the general vicinity of Loughteog and Coolnaback there will be a locally significant landscape effects due to the combination of the existing 400kV and 110kV lines, the proposed substation and the proposed 400kV link.

The route selection process was the main method used to avoid landscape effects.

1.6 CULTURAL HERITAGE

An architectural, archaeological and cultural heritage assessment has been undertaken as part of this EIS. The purpose of this assessment is to identify any potential impacts on the Cultural Heritage landscape to include material aspects of environmental constraints. It amalgamates desk-based research and the results of field surveys to identify areas of archaeological, architectural or cultural heritage significance or potential, likely to be impacted by the proposed reinforcement project.

A desk-based constraints study for a broad study area was initially undertaken which was then followed by an assessment of potential substation sites and potential route corridors.

A number of documentary and cartographic sources were consulted in order to identify and map nearby cultural heritage sites. A programme of field walking along each unit of the reinforcement project to include proposed structures (polesets and angle masts), substation sites, indicative construction access tracks and guard points was also undertaken in order to assess the potential impact of the project on recorded archaeological monuments, protected structures and any items of built cultural heritage. The field work also served to identify any previously unrecorded archaeological monuments or features/structures of architectural or cultural heritage significance. The assessment of the archaeology and cultural heritage along the proposed reinforcement project was carried out with regard to the Code of Practice between EirGrid and the Department of the Environment, Heritage and Local Government (DoEHLG) (2009).

No significant impacts on the archaeological, architectural or cultural heritage along the proposed reinforcement project have been identified. Where potential impacts have been identified they are mainly categorised as 'slight' and appropriate mitigation has been recommended in order to minimise any such impact. No cumulative impacts arising from the impacts of other existing developments and the proposed development were identified.

1.7 ECOLOGY

This EIS presents an Ecological Impact Assessment (EcIA) of the proposed development. The potential impacts (direct, indirect and cumulative) of the proposed development on the flora and fauna of the study area are assessed.

A number of ecological reports and surveys have been carried out during the constraints identification and route evaluation stages of the proposed development that have enabled an assessment of the potential ecological impacts of the proposed scheme. These reports and surveys include:

- Ecological constraints report on the study area
- Winter bird surveys undertaken over two seasons (January 2010 – April 2010 and October 2010 - April 2011)
- Ecological assessment of potential route corridors and route selection
- Ecological Assessment of potential substation site options and site selection
- Assessment of preferred route corridor which included multidisciplinary walkover surveys of line routes and substation sites associated with the development

A description of the existing ecological environment surrounding the proposed development (divided into eight individual components or units) is presented, paying particular attention to features of ecological interest. Those features of particular interest in the surrounding area are associated with the River Barrow and River Nore candidate Special Area of Conservation (cSAC) (a designated site of European significance). The potential impacts of the proposed development on this and other European sites in the surrounding area have been assessed in the form of a Natura Impact Statement (NIS), which was submitted with the planning application documents in 2013.

The conclusion of the NIS is such that, the correct implementation of all mitigation measures detailed in the former Environmental Report (now included in this EIS) will ensure that the conservation objectives for the cSAC will not be compromised by the proposed development, nor by any cumulative effects and no significant impact is anticipated on any of the species and habitats for which the site is designated. It is the considered view of the authors of the NIS that the proposed development will have no adverse impact on the integrity of the designated site as a whole or on any other designated site.

Most of the lands that are present within the substation sites and along the line routes are of low ecological value with few areas of semi-natural habitat recorded. The ecological characteristics of the line routes, substation sites and surroundings are evaluated and features and areas of particular ecological sensitivity identified.

Potential direct and indirect impacts of the proposed scheme on ecology are described and assessed. Predictions are made with regards to the magnitude and significance of these impacts; and these impacts range from imperceptible to minor in significance.

Following suggested mitigation, the potential ecological impacts of the proposed development are reduced to give at most an imperceptible negative impact at the local scale. It is concluded that the impacts of the construction, operation and decommissioning of the reinforced electrical infrastructure on the ecology of the study area are likely to be imperceptible provided construction, management and restoration on decommissioning follow best practice procedures, and the proposed mitigation measures are adopted.

1.8 SOILS AND GEOLOGY

This section assesses the potential impacts on soils and geology arising from the proposed Laois-Kilkenny Reinforcement Project.

An extensive walkover survey (where permissible) and windscreen surveys of the substation sites, structure locations (proposed wooden poleset locations, proposed angle mast locations, guarding points) and indicative construction access tracks were carried out in October 2011, June 2012 and June 2013 by environmental consultants from AWN Consulting Ltd, in order to assess the baseline soils and geological environment in the study area and confirm the findings of the desk study, of conclusions site investigation reports in relation to the proposed Coolnaback and Ballyragget substations, numerous guidance documents and other relevant publications.

A description of the receiving environment in terms of soils and geology was noted. Alluvium is present at the proposed Coolnaback substation location and surrounding area. Gleys and Grey Brown Podzolics are the distinct soil types that exist along the line routes. The subsoils comprise of till derived from bedrock sandstones, shales and limestones of the Carboniferous Period.

The Geological Survey of Ireland (GSI) was consulted in relation to any areas of geological heritage or interest located in the study area. According to the GSI, there is 1 no. site of geological interest that lies within the vicinity of the proposed Coolnabackey substation (located 250m. South) - Timahoe Esker ridges. There are three sites of geological interest in the vicinity of the proposed line route. These are Ballyragget Quarry, Dunmore Cave, Balfoyle Channels and the Kyle Spring. 1 no. site of geological interest lies within the vicinity of the Kilkenny substation (located 4km. West) – Archersgrove Quarry.

Potential short term impacts during the construction phase include activities associated with the excavation, handling, storage, transport and re-use of soils, subsoils, bedrock (if present) and contaminated materials (if present), foundations for substations, temporary paving or compaction of soils, temporary construction of tracks and traffic management procedures.

The design of the proposed substations and line routes has taken account of the potential impacts on the soils and geology environment local to the area where construction is taking place. Detailed measures have been incorporated in the design to mitigate the potential impact on the surrounding soils and geology environment. A project-specific Construction and Environmental Management Plan will be established and maintained by the contractors during the construction and operational phases. The mitigation measures for end of lifetime decommissioning phase would be the same as the measures highlighted for the construction phase.

Prior to commencement of development, a Construction Environment Management Plan (CEMP) shall be submitted to, and agreed in writing with, the planning authorities, following consultation with relevant statutory agencies. This plan shall incorporate the mitigation measures indicated in the EIS, and any others deemed necessary, and shall provide details of intended construction practice for the proposed development.

The implementation of the mitigation measures will ensure that the soils and geology environment is not adversely impacted during normal and/or emergency conditions and that the impact will be short term - imperceptible.

1.9 WATER (HYDROLOGY AND HYDROGEOLOGY)

This section assesses the potential impacts on Water (hydrology and hydrogeology) arising from the proposed Laois-Kilkenny Reinforcement Project.

The assessment was carried out according to the methodology specified in Environmental Protection Agency (EPA) guidance documents and included a review of all necessary site investigation reports, water related guidance, policy documents, legislation and databases.

An extensive walkover survey (where permissible) and windscreen surveys of the substation sites, structure locations (proposed wooden poleset locations, proposed angle mast locations, guarding points) and indicative construction access tracks were carried out in October 2011, June 2012 and June 2013 by environmental consultants from AWN Consulting Ltd, in order to assess the baseline water environment in the study area and confirm the findings of the desk study.

The Laois-Kilkenny Reinforcement Project is located within the South Eastern River Basin District (SERBD) as designated under Irish legislation implementing the requirements of the Water Framework Directive (WFD). The study area is within the River Barrow and River Nore catchments.

The proposed Coolnabackey Substation, the proposed Dunstown - Moneypoint - Coolnabackey 400kV line route and the existing Athy - Portlaoise 110kV line are all located within the Stradbally Water Management Unit (WMU) of the River Barrow catchment. Surface water features in the vicinity of the proposed substation and line routes are the Timahoe River, Timogue River and Bauteogue River. Any watercourses within the study area are likely to be tributaries of one of these rivers.

The proposed Ballyragget substation is located within the Nore Main WMU of the River Nore catchment. No major surface water features or field drains were found at the proposed substation location. The River Nore is located 350m west of the site boundary.

The proposed Ballyragget – Coolnabacky 110kV line route (North to South) traverses two separate catchments – The River Barrow and the River Nore and traverses and/or is located within the vicinity of the following watercourses:

- Timahoe
- Timogue
- Bauteogue River
- Owenbeg River
- Ironmills
- Glashagal
- Nore

The existing Ballyragget-Kilkenny 110 kV overhead line route (to be upgraded as part of this project) traverses the River Nore catchment (northern and southern sections of the line route) and the Dinin River sub catchment located in the Northern section of the line route. The proposed line route (North to South) traverses and/or is located within the vicinity of the following watercourses:

- River Nore
- Dinin River
- Pockocke River
- Lyrath
- Scart

The existing Kilkenny 110kV Substation is located within the Nore Main WMU and the River Nore catchment.

In relation to the WFD standards, all groundwater bodies within the study area have been designated 'Good'.

The bedrock aquifer underlying the proposed Coolnabacky substation at a distance of >10m below ground level is classified as a Regionally Important Aquifer; referring to the Ballyadams Limestone Formation. An aquifer is a body of bedrock and/or subsoil that has sufficient properties to allow for a significant flow of groundwater or the abstraction of significant quantities of groundwater. This bedrock aquifer is a source of water supply in the area. The proposed substation is also located on the boundary of defined Locally Important sand and gravel aquifer. According to the GSI, groundwater vulnerability underlying the proposed substation site varied from "Moderate" to "High". Results from the site investigation carried out in 2013 suggest the site has a "moderate" groundwater vulnerability due to the presence of clay deposits.

Regionally Important Karstified (diffuse) bedrock aquifers underlie the proposed Dunstown - Moneypoint - Coolnabacky 400kV line route and the existing Athy - Portlaoise 110kV line route. Locally Important sand and gravel aquifers underlie 45% of the existing Athy - Portlaoise 110kV line route. Aquifer vulnerability is classed by the GSI as 'High' for the proposed line routes.

Regionally Important Karstified (diffuse) bedrock aquifer and a Regionally Important, extensive Sand/Gravel Aquifer underlie the proposed Ballyragget substation. Aquifer vulnerability is classed by the GSI as 'High' for the proposed substation.

The proposed Ballyragget-Coolnabacky 110 kV overhead line route is underlain by Poor bedrock aquifers (64%) and Regionally Important bedrock aquifers (36%). Sand/gravel aquifers are present along 3.4% of the proposed line route. Groundwater vulnerability was varied along the existing line route but was largely classed as 'High' (48.4%) and 'Extreme' (41.5%).

The existing Ballyragget – Kilkenny 110kV line route is underlain by Poor bedrock aquifers (34%), Locally Important bedrock aquifers (16.5%) and Regionally Important Bedrock Aquifers (49.5%). Two separate sand/gravel aquifers underlie approx. 6.4% of the proposed line route. Groundwater vulnerability was varied throughout the line route but was largely classed as High (36.7%) and Extreme (30.7%).

A Locally Important aquifer underlies the existing Kilkenny substation. No gravel aquifers are present under the existing substation. Aquifer vulnerability is classed by the GSI as 'High'.

The key civil engineering works involved in the project are the excavation of material for foundations and deliveries of imported engineering fill, crushed stone, concrete, reinforcement and other construction materials. Other construction activities will include site storage of cement and concrete materials, oils and fuels. Existing access tracks will be utilised. The potential impacts in relation to water include the following:

- Increased runoff and sediment loading
- Contamination of local watercourses and groundwater
- Diversion/Erosion of local watercourses
- Flood Risk
- Dewatering/localised alteration of groundwater flow, rate and direction

The design of the proposed substations and line routes has taken account of the potential impacts on the aquatic environment local to the area where construction is taking place. Detailed measures have been incorporated in the design to mitigate the potential impact on the surrounding water environment. A project-specific Construction and Environmental Management Plan will be established and maintained by the contractors during the construction phase. The mitigation measures for decommissioning phase will be the same as the measures highlighted for the construction phase.

The implementation of the mitigation measures will ensure that the water environment is not adversely impacted during normal and/or emergency conditions and that the impact will be long term - imperceptible.

1.10 MATERIAL ASSETS

This section assesses the potential impacts on material assets arising from the proposed Laois-Kilkenny Reinforcement Project.

The receiving environment is described in terms of traffic, waste and utilities and the potential impacts resulting from the development of this project are both quantified and qualified. A desktop study and surveys were carried out to assess potential impacts. It is not anticipated that there will be any significant impacts on the material assets assessed.

1.10.1 TRAFFIC

The proposed new substation development at Coolnabacky is situated approximately 1.2km to the east of the R426 Portlaoise to Timahoe regional road.

The proposed development at Ballyragget comprises an upgrade to an existing substation facility, adjacent to the R432 regional road, to the north of Ballyragget village.

The proposed development at Kilkenny comprises an upgrade to the existing substation, which adjacent to the R712 regional road.

Traffic Counts were carried on in June and July 2012 at three locations - (the N77 and the R432 northern approaches to Ballyragget Village and the R426 between the Money Crossroads and Timahoe).

This exercise was undertaken by AECOM Transportation consultants to provide baseline traffic flow data for the access roads serving the Coolnaback and Ballyragget sites, including volumes of traffic and vehicle speed data in the vicinity of the proposed access junctions.

A feasibility study was also carried out on the entrance and access routes to the proposed substation site at Coolnaback and also at the existing Ballyragget station, to determine the most appropriate access position and measures to ensure adequate visibility sightlines for future operational traffic turning in or out of these accesses.

AECOM Transportation consultants were also commissioned to carry out a Haulage Assessment Report for the transportation of abnormal loads, assumed to be two transformers delivered to the site at Coolnaback, from Dublin Port.

Potential short term impacts during the construction phase associated with traffic include construction traffic for development of substations and overhead lines. The percentage increase in traffic due to the proposed development works is low in relation to current traffic volumes.

In general, it is not anticipated that there will be any significant impacts on the existing traffic flow as a result of this development. Predicted impacts will primarily occur during the construction phase of the project but these will be short-term in nature.

To facilitate electricity cable laying under the R432 to the Ballyragget substation road works will be required and a Traffic Management Plan will be put in place to minimise potential impacts on road users and ensure safety. In addition to general warning signs advising road users of construction activity, appropriate signage and control measures will be used at all times where there are works within the roadway area which may impact on the available road width.

A Traffic Management Plan will be prepared and included as part of the Construction Environmental Management Plan (CEMP).

Having regard to the existing low volumes of traffic using the roads in the vicinity of the proposed substation sites, it is not considered that the presence of additional heavy vehicles associated with the construction of the proposed development will have a detrimental impact on road safety on these roads.

The impact of overhead line construction on traffic flows generally is not significant. Construction impacts will be short term and peaks in activity will be for short durations only. Detailed traffic management and safety measures will be put in place prior to any overhead works crossing over roads. Additional traffic volumes for the construction of each angle mast and poleset will be very low and for a very limited duration.

At operational phase, the substations will be generally unmanned therefore traffic will be limited to a relatively small number of personnel for maintenance and servicing requirements at substations with infrequent visits to the sites.

The implementation of the mitigation measures will ensure that traffic is not adversely impacted during normal and/or emergency conditions, and it is considered that the impacts on traffic will be short term and very slight.

1.10.2 WASTE

The generation of waste is the main potential impact from the proposed development.

The main waste arising from construction will be generated from the development of Coolnaback 400/110 kV substation, development of the 110 kV substation in Ballyragget, the redevelopment of the existing Ballyragget 38 kV substation and from overhead lines. A small quantity will also be generated from construction works at Kilkenny substation.

As part of the construction process for Coolnabacky substation, inert soils and subsoils will be excavated, generating an estimated volume of 8,000 m³ of material. Inert soils and subsoil material from Ballyragget is estimated to be 3,500 m³. This material will be transported to the site at Coolnabacky for landscaping purposes including the construction of an earthen berm at the Coolnabacky substation.

Waste generated by the development will include demolition waste, steel, copper, aluminium, general waste (temporary facilities), waste oil, timber and concrete. Conductors and insulators will also be generated from the decommissioning of existing lines. Waste materials will be segregated and stored for reuse, recycling or disposal where applicable.

The presence of asbestos or Polychlorinated Biphenyls (PCBs) is not envisaged, however, should hazardous waste be found, a licensed contractor will handle and dispose of the material according to all applicable regulatory requirements.

Material arising from the overhead line development will include wooden poles, steel and conductors. A total of 126 structures will be removed in total, including wooden polesets and steel towers.

Waste arising from the project will have a cumulative impact on traffic volumes however the volume anticipated that impacts would not be significant.

Waste generated from construction activities will be sent to licensed facilities where recycling will occur where possible. Landfill waste will consist of domestic wet waste from canteens. All other materials can be recycled. Following good waste management practices it is not expected that waste arisings from the project will give rise to significant impacts.

The implementation of the mitigation measures will ensure to minimise waste generation, segregate waste at source and ensure all waste is disposed of by licensed waste contractors.

1.10.3 UTILITIES

1.10.3.1 Gas

Information provided on the natural gas distribution network by Bord Gáis does not indicate the presence of any gas infrastructure at the proposed sites.

1.10.3.2 Telecoms

Where the crossing of existing telecom services is necessary during construction, maximum efforts will be made to minimise disruption of the service.

1.10.3.3 Water

Water will be imported by tanker for construction works at Coolnabacky substation. It is proposed to meet the long-term water demand from the substation from the local groundwater resource through a bored well. The expected demand will be similar to that of a domestic supply as it will be used primarily for sanitary services and canteen purposes. The substation will be unmanned and the water demand will be low and intermittent. At the substation site in Ballyragget, the proposal is to connect to the existing water mains along the R432 road adjacent to the site, subject to permission from the Local Authority.

1.10.3.4 Wastewater

A holding tank is proposed to collect sewage effluent from the proposed sanitary facilities at Coolnabacky. Holding tanks will be constructed in accordance with the requirement of the local authority and managed accordingly also. This tank will be emptied and the effluent disposed of by a licensed waste contractor at regular intervals. During construction works at the Ballyragget site, foul sewage tanks/facilities will be made available by the contractor. These will be emptied and disposed of by a licensed waste contractor at regular intervals. A wastewater treatment system comprising septic tank and percolation area is proposed at Ballyragget as a permanent system for the station.

1.10.3.5 Energy

During construction, generators will be used onsite at Coolnaback as an energy supply. The diesel generator may be connected to the station AC system until a permanent AC supply can be obtained. The permanent supply will be from a 200 kVA house transformer. Both Ballyragget and Kilkenny substations have existing energy supply.

1.10.4 AGRICULTURAL IMPACT ASSESSMENT

The proposed routes of the overhead transmission lines that make up the Laois-Kilkenny Reinforcement Project traverse approximately 50 km of land and approximately 150 agricultural holdings.

The makeup of the farm holdings is typically small to medium sized farms. Topography, climate and soil characteristics combine to give a range of agricultural activities from intensive tillage to intensive and extensive grassland based enterprises.

Overall there will be a very small loss of land to agricultural land from the project (a total of approximately 12.35 hectares over the entire length of the line including approximately 9 hectares associated with the proposed substations).

For over 95% of the land holders the residual impacts at the construction, operation or decommissioning stages is either none or negligible. Of the total number of land holders involved only 7 will have either minor, moderate or major impacts and this is mostly at the construction stage.

The line from Ballyragget to Kilkenny is an upgrade of an existing line and consequently the impacts on farming will be no greater than those already being experienced, except for the impact at the construction stage. For the section of the line between Coolnaback and Ballyragget, the presence of the new structures on farmland will have minor impacts on agricultural activities after the construction stage with again, the major impact on agriculture occurring at the construction stage.

The mitigation measures proposed and particularly the proposal to engage fully with each farmer in advance of access to determine the least disruptive access and operation procedures will ensure minimal impacts on farming and farming enterprises at the construction stage.

1.11 AIR AND CLIMATE

1.11.1 Air and Climate

Baseline air quality is measured by the Environmental Protection Agency (EPA) by zones in Ireland. In terms of receiving environment, the proposed development is classed as zone D in regard to air quality. Air quality in zone D is generally good, with low concentrations of pollutants. Air monitoring results from air monitoring stations located nearest to the proposed sites in Emo and Kilkenny have shown no exceedances of parameters to air.

One industrial emission source, Glanbia Ingredients Limited, is located within one kilometre of the proposed Ballyragget substation. The plant is located on the opposite side of the river Nore, on the N77 between Ballyragget and Durrow.

The primary existing source of air emissions at substation and overhead line sites comes from passing traffic, including farm machinery, natural land use and HGV's.

Short term impacts on local air quality will arise from construction related emissions but the overall impacts on air quality will be negligible both in the national context and in the immediate receptor area. The main potential impact to air quality at construction sites will come from dust. Dust generated by construction activity can give rise to local nuisance. However the impact of this will depend largely on climatic factors such as rainfall, windspeeds and wind direction.

Construction vehicles and machinery travelling to and from the site and the transport associated with deliveries of materials will give rise to exhaust emissions.

Corona activity from transmission/distribution lines can produce a small quantity of gaseous oxidants in the air however it does not significantly contribute to overall air pollution levels.

The proposed Coolnaback and Ballyragget GIS substations will use SF₆ gas (Sulphur Hexafluoride) as an insulating material. SF₆ is a powerful greenhouse gas however it is not an ozone depleting gas. SF₆ is non-flammable, non-corrosive to metals at ambient temperatures and non-toxic at steady state. GIS switchgear at the substations will be enclosed in a building and SF₆ containing equipment will be hermetically sealed to prevent leakage.

Impacts will be short term and can be controlled using good site practice and good engineering construction practices during the construction phase. To prevent dust becoming a nuisance during the construction phase, dust suppression such as wheel washing of vehicles and dampening down of sites, lanes and roadways with water will be carried out in prolonged dry periods.

The decommissioning phase would involve the same main impacts as the construction phase, i.e. dust and transport emissions. No cumulative impacts are envisaged.

1.11.1.2 Noise

Baseline noise surveys and a noise impact assessment were prepared by Biospheric Engineering Ltd. A noise prediction model for the transformer/substation noise at Coolnaback was also prepared.

In terms of receiving environment, 1 no. long-term, 21 no. short-term measurements and additional short term monitoring were undertaken in June/July 2012 in good weather conditions at the proposed substation locations, and along the proposed Ballyragget - Coolnaback and the Ballyragget - Kilkenny overhead lines to determine background noise.

The background noise levels at the Coolnaback site are relatively low (LA_{eq} levels measured at 37 dBA at night and 46 dBA during the day). The measured noise levels at Ballyragget substation were 58 dBA during the day and 48 dBA during the night.

Potential short term impacts during the construction phase include activities using large equipment such as excavators and dozers for site clearance and a crane for installation of the transformers.

The construction phase will involve earthworks on areas of the site and the erection of new buildings which will give rise to localised elevated noise levels. This impact is considered relatively short-term in nature. The primary source of noise in the operational context will be the noise emission from the mechanical and services plant associated with the development, i.e. transformer noise and other mechanical and electrical services.

During erection of the lines, there may be additional noise on a small scale at localised pole sites or tower sites along the line route, however, since such activities are confined to day light hours and will be of a short duration, these temporary increases in noise levels are generally acceptable.

Transformer noise takes the form of a low frequency hum that can be tonal in nature. Due to the low background noise levels in the immediate area of the sub-station at Coolnaback, the transformers will be audible outside the sub-station boundary area under certain weather conditions. The area in which the transformers are likely to be audible does not include any residences. Residences in the area are generally located along the road network and background noise measurements at these locations are considerably higher than at the sub-station site, providing sufficient masking for any noise emanating from the sub-station.

Measured noise levels at the nearest noise locations in the area indicate that these levels are generally higher than currently existing levels at the proposed substation site. This is due to existing road traffic near the residences whereas the proposed substation site is more remote. Noise modelling of the

substation site indicates that the noise from the substation will not increase the existing background level at the residences and no significant impact is predicted to occur.

Noise from overhead lines can be generally classed as either aeolian (wind-induced) noise, corona (electrically-induced) noise or from gap sparking. Gap sparking occurs at tiny electrical separations (gaps) that develop between mechanically connected metal parts which give rise to electrical noise. Gap sparking can develop at any time on power lines at any voltage and is monitored by the network. Corona noise is not expected to give rise to complaints for the Laois-Kilkenny Project. Aeolian noise rarely occurs on overhead lines and in the unlikely event of it occurring, appropriate mitigation measures will be applied.

There will be some small, short-term impact on nearby residential properties due to noise emissions from site traffic and other activities during construction. Traffic impact will be short-term and of a temporary nature and will not be excessively intrusive.

Overall, the predicted noise impact from the development will be low and is not expected to give rise to complaints from local residents.

The implementation of the mitigation measures will ensure that noise from construction activities and electrical equipment is minimised.

1.12 INTERRELATIONSHIPS BETWEEN ENVIRONMENTAL FACTORS

While almost all environmental aspects are interrelated to some degree, only significant interrelationships are considered in this EIS.

The potential for interactions arising between environmental topics includes that between:

- human beings and population and landscape;
- human beings and population and cultural heritage;
- human beings and population and material assets (traffic);
- human beings and population and air and climate (air quality and noise);
- landscape and cultural heritage;
- ecology and water;
- soils and geology and water;
- soils and geology and material assets (waste management);
- water and material assets (waste management); and
- air and climate (air quality and noise) and material assets (traffic);

All potential effects that occur between the different environmental topics as a result of the project's potential direct effects have been mitigated, during the design stage of the project.