Inspector's Report

VA0017.

1.1.1.

Development	Development of a 400kV electricity transmission interconnector linking the electricity transmission networks of Northern Ireland and Ireland between the existing Woodland Substation in Co. Meath and a planned substation in Turleenan, Co. Tyrone (North-South 400kV Interconnection Development).
Location	County Monaghan, County Cavan and County Meath
Planning Authority(s)	Monaghan County Council Cavan County Council Meath County Council
Applicant(s)	EirGrid plc
Type of Application	Application for approval under Section 182A Planning and Development Act 2000 (as amended)
Prescribed Bodies	• Department of Arts, Heritage and the Gaeltacht • Minister for Communications, Energy and Natural Resources • Transport Infrastructure Ireland • Failte Ireland • An Taisce • Eastern and Midlands Regional Assembly

	• Northern and Western Regional Assembly • Inland Fisheries Ireland • Geological Survey of Ireland • Irish Water • Health Service Executive • DoE Strategic Planning Division, Northern Ireland
Observers	c.900 (Appendix 1)
Date of Site Inspection	22nd, 23rd and 24th September, 2015 20th, 21st and 22nd October, 2015 22nd, 23rd, 24th and 25th February, 2016
Inspector	Breda Gannon, Senior Planning Inspector (Lead) Deirdre MacGabhann, Senior Planning Inspector
Appendices	1. List of observers and main issues raised. 2. Schedule of oral hearing and topics. 3. Documents submitted to oral hearing. 4. Photograph of St. Patrick's Church, Ardagh.

Contents

1.0 INTRODUCTION

1.1. The Interconnector

In June 2015, EirGrid plc made an application to the Board for approval under Section 182A of the Planning and Development Act 2000 (as amended) for that part of a high capacity electricity interconnector between Ireland and Northern Ireland (the North South Interconnector), that falls within the Republic of Ireland. The application for that section of the development in Northern Ireland is brought forward by SONI (System Operator for Northern Ireland).

The proposed development will stretch over approximately 135km and will link the existing electricity transmission networks of the two jurisdictions between the existing substation in Woodland, Co. Meath and a planned substation in Turleenan, Co. Tyrone. In the Republic of Ireland, the development will pass through County Monaghan, County Cavan and County Meath. It will form part of the all-island transmission network and will provide a second high capacity electricity connector between Ireland and Northern Ireland. The existing interconnector, a 275kV double circuit overhead transmission line connects the existing Tandragee and Louth substations.

The proposed interconnector has been designated as a Project of Common Interest (PCI) in the first Union List created under Regulation (EU) No. 347/2013 'Guidelines for Trans-European Energy Infrastructure'. This is the first PCI to seek approval in the State.

1.2. Report Structure

This report comprises an assessment of the application for approval by EirGrid. It comprises:

- A description of the proposed development and its route through County Monaghan, County Cavan and County Meath.
- A summary of the legislative framework and policy context for it.
- Details regarding the submissions received by prescribed bodies, planning authorities and interested parties (the observers).

- A planning assessment of the merits of the project, in particular with regard to the issues raised by prescribed bodies, planning authorities and the observers.
- An environmental impact assessment and appropriate assessment in respect of the proposed development.
- A recommendation in respect of the application for approval.
- Reasons and considerations and conditions in respect of the application for approval.

1.3. The Proposed Development

The proposed development comprises a new single circuit overhead transmission line of c.100.5km in length, extending in a generally southerly alignment from the border with Northern Ireland. It would entail the construction of 299 steel lattice support structures, ranging height from 26m to 51m over ground level, with associated conductors, insulators and other apparatus.

The proposal also includes the addition of a new 400kV circuit for approximately 2.85km along the currently unused northern side of the existing Oldstreet to Woodland 400kV transmission line in County Meath. The existing double circuit steel lattice support structures range from approximately 52m to 61m over ground level.

The proposed development includes modifications to three existing 110kV overhead lines to ensure that there is sufficient clearance maintained between the 110kV overhead line and the 400kV conductor at the point of crossing. The modifications will be carried out where the proposed development intersects the following:

- The Lisdrum to Louth 110kV transmission line in Drumroosk, Co. Monaghan.
- The Louth to Rathrussan 110kV transmission line in Corrinenty and Corbane, Co. Monaghan.

- The Arva to Navan 110kV transmission line in Gibstown Demesne and Teltown, Co. Meath.

Modifications will be achieved by the insertion of additional polesets and/or replacement of existing structures with polesets of lower height (11.5m to 19m over ground level). The replacement polesets will be positioned immediately adjacent to existing polesets.

The proposed development includes an extension to the existing Woodland substation in Co. Meath to allow the connection of the new 400kV circuit. The work would be carried out on a site of approximately 0.544ha within and adjacent to the existing substation. It would include a western extension of the existing compound, on c.0.231ha, including associated modifications to the existing 2.6m high palisade boundary fence, the addition of electrical equipment and apparatus (ranging in height from 7.4m to 13.7m), gantry structures (c.28m in height), lighting monopole (c.28m in height) and all associated ancillary construction and site development works. The proposed extension would take place entirely within ESB owned lands and will essentially comprise a new bay within the existing substation.

A temporary construction materials storage yard (1.4ha) would be located at Monaltyduff and Monaltybane, Carrickmacross, Co. Monaghan and would include associated site works, new site entrance onto the L4700 Local Road, associated 2.6m high boundary palisade fencing with noise barrier (2m) and associated ancillary staff facilities and parking. The yard would be positioned immediately adjacent to the southern side of the N2 National Primary Road. The application is supported by a letter of consent from the landowner to the making of the planning application.

Three types of towers will be used for the transmission line:

- Intermediate or suspension towers on straight sections of the alignment,
- Angle/tension towers where the alignment changes direction or terminates, and
- Transposition towers where the physical position of the conductors on the transmission line will be changed (between Towers 119 and 120). The

chosen tower design is the IVI lattice tower. The towers will be made from galvanised steel and will be grey in colour and will be placed c.340m apart.

The working area for each tower site would be contained within an area of approximately 900m^2 (30m x 30m). Typical tower foundations range from 2m to 3.5m in depth to the invert level of the foundation and from 2m x 2m to 9m x 9m in plan, depending on the type of tower. Temporary access routes (up to 4m wide) will be required for the construction of each tower, installation of conductor and setting up of guarding locations. Access routes may require the installation of temporary tracks where ground conditions are poor or in sensitive areas.

The construction period for the overall works is expected to extend over a period of three years. Construction at each tower site will be undertaken in five stages, as follows, on a rolling programme:

- Stage 1 – Preparatory site work (1-7 days).
- Stage 2 – Tower foundations, standard installation (3-6 days), piling installation (5-10 days).
- Stage 3 – Tower assembly and erection and preliminary reinstatement (3-4 days).
- Stage 4 – Conductor/insulator installation (7 days).
- Stage 5 – Final reinstatement of land (1-5 days).

Stages 1 to 3 are anticipated to take 6 to 8 weeks at each towers site. Stages 4 to 5 will take place once Stage 1 to 3 are completed, approximately 1 year later.

The application comes forward with fixed tower positions. Approval is not sought for micro-siting.

1.4. Application Documentation

Details regarding the proposed development are set out in the following application documentation. These are referred to in the course of this assessment.

- Volume 1 – Statutory Particulars.
    - Volume 1A – Application Form and Particulars.
    - Volume 1B – Planning Drawings.
- Volume 2 – Planning Documents.
    - Volume 2A – Planning Report and Appendices.
    - Volume 2B – Public and Landowner Consultation Report and Appendices.
- Volume 3 – Environmental Documents
    - Volume 3A – Non-technical Summary.
    - Volume 3B – Common Chapters, Cavan Monaghan Study Area and Meath Study Area, Appendices, Figures and Reference Material.
    - Volume 3C – Cavan Monaghan Study Area Report, Appendices and Figures.
    - Volume 3D – Meath Study Area Report, Appendices and Figures.
- Volume 4 – Joint Environmental Report, Appendices and Figures. (This contains a copy of the EIS in respect of the application for the proposed development in Northern Ireland).
- Volume 5 – Natura Impact Statement.

1.5. Site Description

As the proposed linear development extends over a large geographical area, the applicant's evaluation of it is presented in two section of the single EIS, the Cavan Monaghan Study Area (CMSA) and the Meath Study Area (MSA). The site of the proposed development is described below, by reference to these two areas. This

section of the report should be read in conjunction with Figures 11.3 to 11.6 of Volumes 3C and 3D.

1.5.1. Cavan Monaghan Study Area (CMSA)

The rural landscape of County Monaghan and County Cavan, through which the proposed development is routed, is characterised by the distinctly drumlin topography, small field pattern, lowland lakes and woodland and scattered rural development. Land uses are almost wholly agricultural.

The northern section of the alignment commences close to the border with Northern Ireland at Tower 103. From here it travels in a south - easterly direction in the townland of Lemgare and runs parallel with a local road that forms part of the Monaghan Way walking route. It oversails part of the jurisdictional border in Crossbane and is routed through a valley that straddles both jurisdictions. At Tower 109, which is positioned in an elevated position close to Lemgare Rocks, the route changes direction, travelling in a generally south westerly direction, through rolling drumlin topography interspersed with small lakes. It avoids Tassan Lough and the Cashel Bog Complex to the south and the Battle of Clontibret site to the west.

The alignment continues its passage south crossing the existing Lisdrum-Louth 110kV line and is routed to avoid lakes and settlements. It crosses a number of local roads and the R183. It avoids Ballybay to the west and Castleblaney to the east and is c 1.5km west of the village of Doohamlet.

Between Towers 142-149 the proposed development crosses a valley to the east of a ridge line which follows the direction of the public road. It avoids the wetlands at Crinkill and mixed woodland that are located either side of the route. As it continues to move south/southeast the alignment passes through undulating farmland. It crosses a number of local roads. It is routed away from the R180, from Lough Egish and the scenic route to the north of the lough.

In the vicinity of Tower 169, the alignment crosses the R181. It avoids Shantonagh Lough to the west and Bocks Lough, a wetland complex of high local

value. Many local roads in the area have ribbon development. The route crosses the existing Louth-Rathrussan 110 kV line close to Tower 180.

As it continues south/south west the alignment crosses the proposed development crosses the R178 Shercock to Carrickmacross Road. It avoids the two towns, small settlements and the high ground at Shanco. At Raferagh the route moves in a south-easterly direction, avoiding lakes to the east and west of the alignment. It continues its passage through drumlin topography, avoiding clusters of houses and lakes located in the inter drumlin hollows. It crosses the R162 approximately 5.5 km north-west of Kingscourt and the Cavan Monaghan county boundary.

At Tower 224, the alignment travels south-west to cross the R165 Kingscourt - Bailieborough road, approximately 3.2 km west of Kingscourt. The alignment avoids Lough an Leagh Mountain, Dun An Ri Forest Park and ribbon development associated with Kingscourt. It moves southwest avoiding Muff Lough and takes a straight line trajectory between Towers 228 and Towers 237, crossing the Flagford-Louth 220 kV line before turning east on its journey through County Meath.

1.5.2. Meath Study Area (MSA)

The proposed development commences in the Meath Study area approximately 5km south east of Kingscourt in a rural area that is characterised by its drumlin landscape. From the public roads in the area, landscape features comprise the undulating topography, mature roadside vegetation, hedgerows, trees and small woodlands separating agricultural fields, farm buildings and one-off housing along county roads. The route progresses in a south easterly direction, crossing Kilmainham River, towards Kilmainhamwood, which it passes c.1km to the west of the village. Continuing in a south-easterly direction the route passes to the west of Whitewood House. This elevated property and its associated demesne lands lies c.1km to the east of the route and to the east of Whitewood Lough.

Crossing the public road, the route moves east (between Towers 262 and 263) and then travels in a south easterly direction through woodland and agricultural land forming part of the Brittas Estate. The village of Nobber lies to the east of the demesne lands and a disused railway line (between Navan Town and Kingscourt)

runs in a north south direction between Brittas Estate and the village. To the south west of the Brittas Estate is the elevated townland of Cruicetown, with the remains of Cruicetown Church and Graveyard (a National Monument) and Cruicetown Lough lying to the north east of the structures.

Continuing in a south/south easterly direction, the route crosses the public road in the townland of Rahood and continues across agricultural land between the public roads, both east and west of the route, to cross the N52 (with Towers 280 and 281 spanning the road). To the south west of the route, approximately 400m from the proposed centreline of the development lies Drakerath House with its small demesne landscape.

From the N52 the route continues in a southerly direction, again between public roads, both east and west of the route. The landscape now becomes less undulating, more open and with more substantial agricultural fields. Approximately 3km south of the N52 the line passes through woodland and agricultural land forming part of Mountainstown House and Demesne. The smaller Dowdstown House and Demesne lie to the south of Mountainstown Demesne and c.500m to the east of the route. Both Houses are set within landscaped grounds with substantial tree cover. South of Mountainstown Demesne the route turns south west and crosses a large area of bog before crossing a minor public road in the vicinity of Tower 295. From here the route turns south east and passes between the villages of Oristown and Clongil, c. 1.5km to the west and c. 1km to the east of the centreline of the route, respectively. South of the public road the route progresses in a southerly direction, crossing the R163, towards Donaghpatrick.

South of the R163 the route enters the Blackwater Valley, a designated Landscape Character Area of Very High Landscape Value (Meath CDP). The route of the proposed development runs through the more open, riverside landscape of the LCA for c.3km passing c.800m to the east of site of the Tailteann Games and c.1.5km to the west of the village of Gibstown (Baile Ghib). Approximately 500m north of the village of Donaghpatrick, the route turns south west and crosses the existing Arva to Navan 110kV overhead line to the west of the village. Approximately 1km south west of the village of Donaghpatrick, the route crosses the R147 between Navan Town and Kells and leaves the

Blackwater Valley. The regional road forms part of the Boyne Valley Driving Route, a 225km long designated Driving Route in County Meath which takes in 22 historic sites. Kells town lies c.7km to the north west of the route at this point.

South of the R147, the proposed development turns south east to cross two public roads and the M3. Ardbraccan House and its associated demesne lands lies c.1km to the east of the proposed development. The proposed development runs to the west of the M3 Motorway generally on agricultural land between public roads. In the vicinity of the townland of Irishtown, the route passes Boyerstown National School, c.700m to the east of the line and then crosses the N51 between Navan Town and Athboy. South of the N51 the line runs in a south easterly direction and then south to pass c.100m to the east of Churchtown House and Demesne lands. Continuing south, the lines passes through Philpotstown Demesne, immediately east of Dunderry village. On exiting Philpotstown Demesne the line turns south east, approximately following the route of the Clady River which lies to the south west.

Approximately 1km south of the village of Robinstown, the line crosses a public road and Clady River and enters the Boyne Valley a designated Landscape Character Area, with Exceptional Landscape Value (Meath CDP). The proposed development crosses the Landscape Character Area in a south easterly direction, over a distance of c.3km. It crosses the R161 between Trim and Navan, passing approximately 800m to the north east of the GAA's grounds at Dunganny and 1.5km north east of Trim Airfield. Progressing in a south-easterly direction from the R161, the proposed line passes c.1km to the south west of Bective Abbey and north east of Rathnally House and Demesne and crosses another section of the Boyne Valley Driving Route.

The proposed development leaves the Boyne Valley Landscape Character Area just north of the townland of Creroge and it progresses in a generally south/south east direction. Approximately 2.5km and 6km respectively to the north east of the alignment are the village of Kilmessen and the Hill of Tara.

The proposed development continues in a southerly direction to cross the R154 and Boycetown River. Approximately 200m north of Galtrim House and its Demesne lands the proposed development turns south east, crosses Galtrim

Moraine and runs in a south easterly direction to the townland of Derrypatrick. The landscape is now characterised by a flat topography, large agricultural fields, mature hedgerows, trees and woodland, often associated with the demesne landscapes.

Continuing in a south easterly direction from Derrypatrick, the proposed line crosses Derrypatrick River, approximately 1km south east of the village, and then turns in a more southerly direction to pass Culmullen House and Demesne lands, c. 350m to the north east of the route. At this point the route enters the Tara Skryne Hills Landscape Character Area, of Exceptional Landscape Value, (Meath CDP), the broad rolling hills that include the Hill of Tara. Within the vicinity of the proposed route the landscape is generally flat, with large agricultural fields surrounded by mature roadside vegetation. The proposed alignment continues in a south easterly direction to join the existing Oldstreet to Woodland 400kV line, c.500m south east of the R125, at Tower 402. The existing line runs for approximately 2.85km in an east-west direction to the existing Woodland substation. Two further high voltage lines exit the substation to the north east and south east. Access to Woodland substation is from a minor county road. Views of the sub-station area from the public road are limited due to bunding surrounding the site and mature roadside vegetation.

1.6. Planning History

The application for the proposed development comes forward within the following planning history.

1.6.1. Transmission Line

An application for the Meath – Tyrone 400kV Interconnector development was made to the Board, under 02.VA006, in 2009. This application was withdrawn in 2010.

Under 02.VC0054 pre-application consultations in respect of the proposed development were carried out between the prospective applicant and the Board. The Board, in February 2014, determined that the proposed development does

constitute strategic infrastructure development and that an application should be made directly to the Board.

1.6.2. Woodland 400kV Substation

The following applications have been approved by the Board:

- DA/130761 – Permission granted subject to conditions for the erection of 2 No. acoustic barriers and all associated site development works at Portan Converter Station, Woodland. Co Meath.
- DA/110127 – Permission granted subject to conditions for alterations to the existing 400 kV electrical transformer station consisting of a new 400 kV/220kV transformer with concrete bund, 400kV transformer bay, 220 transformer bay, bushbar extensions, lighting arrester, oil interceptor and associated site works.
- 17.VA0002 – Permission granted subject to conditions for works within the overall Woodland Substation as part of the East West HVDC Interconnector. The consent included a converter station with cable bay located at the south-east of the Woodland 400kV Substation.

1.6.3. Wider Area

Development which has been approved or is proposed in the wider area of the proposed development is set out in Chapter 10 of Volume 3B of the EIS. This development, and any applications which have been made to the Board since the application for the proposed development was lodged, are referred to as necessary in the relevant sections of this report.

2.0 LEGISLATIVE FRAMEWORK AND POLICY CONTEXT

2.1. Introduction

The legislative framework and policy context for the proposed development is set out in Volume 2A of the application documentation (Planning Report). It is summarised here with the Board's attention drawn to key policy documents.

2.2. Legislative Framework

2.2.1. Strategic Infrastructure

Following pre-planning consultation with the Board, it was determined that the development falls within the scope of section 182A of the Planning and Development Act, 2000, as amended, and constituted strategic infrastructure. This requires that the application be made directly to the Board.

2.2.2. Environmental Impact Assessment

The proposed development constitutes a project for the construction of an overhead electrical power line with a voltage of 220 kV or more and a length which exceeds 15km. Consequently, if falls within Class 20 of Part 1 of Schedule 5 of Planning and Development Regulations 2001(as amended) and EIA is mandatory.

2.2.3. Appropriate Assessment

Article 6(3) of the Habitats Directive (Directive 92/43/EEC) requires that 'any plan or project not directly connected with or necessary to the management of a European site but likely to have a significant effect thereon, either individually or in combination with other plans or projects shall be the subject of Appropriate Assessment of its implications for the site in view of the site's Conservation Objectives'. The proposed development is not directly connected with or necessary to the management of any European site but has the potential to have significant effects on European sites, which triggers the requirement for Appropriate Assessment. A Natura Impact Statement has been submitted to

facilitate the Board, as competent authority, in carrying out Appropriate Assessment (Volume 5).

2.2.4. Transboundary Impact

The proposal is a cross-border project extending into Northern Ireland and the Board in its determination following the pre-application consultations concluded that significant effects are likely on the environment of Northern Ireland. Article 7 of the consolidated EIA Directive 2011/92/EU provides the basis for consultation between Member States where a project is likely to have significant effects on the environment of another Member State. Transboundary considerations are considered in the EIS and the overall impacts of the proposal within the two jurisdictions is assessed in a Joint Environmental Report (Volume 4).

2.2.5. Projects of Common Interest (PCI)

The project is designated as a Project of Common Interest in the first Union List created pursuant to the requirements of a new EU regulation for trans-European energy infrastructure (EU No 347/2013). The Regulations seek to modernise and expand Europe's energy infrastructure and to interconnect networks across borders to meet the EU's core energy policy objectives of competiveness, sustainability and security of supply.

The Regulation identifies a limited number of trans-European priority corridors and areas covering electricity and gas networks etc. for which European Union action is needed for the achievement of its energy and climate policy objectives. It establishes Projects of Common Interest (PCI's) for these areas and aims at implementing these priorities and associated PCI's by encouraging member states to streamline and accelerate the permit granting procedures and increase public participation and acceptance for the implementation of such projects. The timely implementation of PCI's is a priority for the EU and there are strict requirements on the permit granting process. These include binding time limits for the entire permit process and the establishment of competent authority to act as one stop shop for permit granting procedures. The Board is designated as PCI Competent Authority for the purposes of the Regulation. It has the role and responsibility of

collating and coordinating the issuing of the various consents and decisions required in respect of the PCI project from all consent authorities and the issuing of the comprehensive decision.

The PCI Regulation requires each project of common interest to be reassessed every two years and a new list of PCIs to be established. The updated list was provided in the Annex to Commission Delegated Regulation (EU) 2016/89 of November 2015. The North-South Interconnector is included in the updated list and accordingly retains its PCI designation.

2.3. Policy Context

2.3.1. European Energy Policy

The EC 2006 Green Paper - *A European Strategy for Sustainable, Competitive and Secure Energy* highlights the challenges facing Europe including expanding population, economic growth, diminishing reserves of fossil fuels, rising energy costs combined with the impact of climate change. It stresses the urgent need for investment in energy infrastructure to meet expected energy demand and to replace ageing infrastructure.

It notes that global demand for energy is increasing and Europe's import dependency is rising. Within the next 20-30 years, unless domestic energy is made more competitive, 70% of the European Union's energy requirements (compared to 50% today) will be met by imported products, some from regions threatened with insecurity. The challenges can be met by the development of an integrated single European electricity market, to ensure security of supply and lower prices. However, it is acknowledged that this will not materialise without additional physical capacity and priority interconnection and this is particularly true for countries like Ireland which remain an 'energy island' largely cut off from the rest of Europe.

The EC Green Paper entitled *A 2030 Framework for Climate and Energy Policies* was adopted in March 2013. It notes that while the EU is making good progress

towards meeting the 2020 target of 20% of energy from renewable sources, creating the internal market for energy and meeting other objectives of energy policy, there is a need to reflect on a new framework for climate change and energy policies. It notes that '*there are key challenges associated with large scale deployment such as the full integration of renewables into the EU's electricity system and that massive investments in transmission and distribution grids, including through cross-border infrastructure, to complete the internal energy market will also be needed to accommodate renewable energy*' (Section 2.2).

In terms of security of supply and affordability of energy in the internal electricity market Section 2.4 of the Framework states:

> *'As none of the energy policy objectives can be reached without adequate grid connections, the Commission has also proposed a Regulation on Trans-European Energy Infrastructure Guidelines on which political agreement has been reached by the European Parliament and by the Council. It addresses infrastructural challenges to ensure true interconnection in the internal market, integration of energy from variable renewable sources and enhanced security of supply'.*

As stated, the proposed development has been designated a project of common interest (PC1) for the purposes of EU Regulation 347/2013. The background to this regulation is the strategy of the European Union to modernise and expand Europe's energy infrastructure and to connect networks across borders to meet its energy policy objectives of competiveness, sustainability and security of supply. A key aim of EU Regulation No 347/2013 is to ensure that strategic policy energy networks in Europe are completed by 2020. Recital 28 of the Regulation states that projects of common interest should be given 'priority status' at national level and treated by competent authorities as being in the public interest.

The proposed interconnector development is included in the first EU list of PCI's and in accordance with Article 7(1) of the Regulation this establishes the need for the proposal from an energy perspective, without prejudice to the exact location, routing or technology of the project. Article 7(3) provides that PCI's shall be

allocated the status of the highest national significance and be treated as such in the permit granting processes.

2.3.2. EU Electricity Directives/Communications

The EIS highlights a number of electricity directives. Directive 2005/89/EC, concerning measures to safeguard security of supply and infrastructure investment, acknowledges the benefits of interconnection in terms of the continued development of the internal electricity market within the EU. It aims to establish measures to safeguard security of supply, to guarantee an adequate level of generation capacity, to guarantee an adequate balance between supply and demand and to set up an appropriate level of interconnection between EU countries.

Directive 2009/28/EC focuses on the need for the promotion of energy from renewable sources and the need to support the integration of renewables into the transmission grid through the development of the transmission and distribution system, including interconnection. Directive 2009/72/EC recognised that cross-border interconnections should be further developed in order to secure the supply of all energy sources at competitive prices to consumers and that Member States and regulatory authorities should cooperate with each other for the purpose of integrating their national markets and to facilitate integration of the isolated systems forming energy islands that persist in the community.

The EIS (Volume 2A) also highlights various Communications issued by the European Commission between 2010 and 2012. The need to reduce emissions of greenhouse gases, increase energy production from renewables, improve efficiency and security of supply and facilitate an integrated EU wide energy market, are core elements of these documents. It is recognised that in order to meet these energy and climate goals, there will be a need for infrastructure development and increased cross-border interconnection between Member States. The most recent published report referred to in the EIS is the *State of the Single Market Integration 2013*, which noted that there is still a lack of integration in the energy market, one cause of which is the limited cross-border

interconnection. The report calls for the swift adoption and implementation of the Energy Infrastructure Package and adoption of the first Union-wide list of Projects of Common Interest in energy infrastructure which are of central importance for a secure and affordable energy supply in the future.

2.3.3. National Policy Context

The *National Spatial Strategy* (NSS)*,* which was published in 2002, is a 20 year framework which seeks to unlock potential for progress, growth and development in a more balanced way across Ireland. The strategy provides a national framework to guide policies, programmes and investment and is both spatial and strategic.

In terms of key infrastructure, it is recognised that physical networks of infrastructure including energy are of particular relevance to the NSS as they have a spatial impact and influence the location, timing and extent of development. It recognises that the most mature and successful economies possess highly developed well integrated infrastructure that supports movement and energy and communications networks.

It identifies areas where strong policy responses are required to ensure substantial progress is achieved towards balanced regional development, including 'Enhanced Accessibility' for urban and rural areas, through an interconnected mesh of efficient and integrated road or rail transport systems, energy and communication grids, all designed to converge at nationally strategic locations.

'*Developing energy infrastructure on an all-island basis to the practical and mutual benefit of both the Republic and Northern Ireland'* is identified as a prime consideration in terms of spatial policy relating to energy (Section 3.7.2 Energy).

The *National Development Plan 2007-2013: Transforming Ireland – A Better Quality of Life for All* provided support for a seven year investment programme for economic and social development in the State. Whilst it is superseded by the revised capital programme (detailed below) to reflect the changed budgetary

situation, it did recognise the gaps and bottlenecks in electricity infrastructure that adversely affect trade between the Republic and Northern Ireland. It acknowledged the importance of the North-South interconnector in terms of enhancing security of supply and doubling the existing cross border electricity transfer capacity. It also acknowledged the benefits that would be delivered to both economies from a more robust electricity network.

The Infrastructural and Capital Investment 2012-2020 (Medium Term Exchequer Framework) was published in 2011. It acknowledges the Government's commitment to ensure that the country's stock of infrastructure is capable of facilitating economic growth in the context of tighter fiscal constraints.

Energy is identified as a key input to economic activity. It is acknowledged that the economy must have a reliable and secure source of energy to ensure a sustainable, secure and competitive energy market underpinned by diverse energy sources, energy efficiency and robust infrastructure; and to help address climate change by meeting our binding obligations in the reduction of energy related greenhouse gas emissions.

In terms of investment in energy infrastructure, it is stated (Section 3.2) that, *'the cost effective maintenance and continued development of the national energy infrastructure networks and the electricity system in particular, is strategically vital for Foreign Direct Investment and indigenous enterprise, for the economy and domestic consumers, and for regional economic investment.'*

Building Ireland's Smart Economy – A Framework for Sustainable Economic Renewal was published in 2008. Its vision is to build a Smart Economy *'that exhibits economic security, high quality employment, strong environmental and social performance and secure energy supplies and is in the strongest possible position to benefit from the recovery of the global economy'*.

It acknowledges that security and reliability of energy supply at competitive cost is critical for Ireland's ability to retain and attract foreign direct investment and that

our reliance on fossil fuels leads to high energy costs which impact on competitiveness. More energy efficiency, accelerated delivery of renewable energy and interconnection with the UK and Europe are identified as critical to reducing energy costs.

The *Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure (*2012), recognises the importance of a guaranteed energy supply at competitive cost to allow Ireland to attract and retain Foreign Direct Investment, sustain Irish enterprise and provide a secure supply for consumers. To achieve this a world class electricity transmission system needs to be delivered in all the regions.

The Policy Statement highlights the need and urgency for new energy infrastructure in the national interest and in the interest of individual consumers. It supports the high voltage electricity transmission system under Grid 25 programme and identifies the Meath –Tyrone transmission link as a vital development for the region, the economy and society as a whole. It accepts that public acceptability of such infrastructure is a major challenge and reaffirms that it is Government policy that these investment programmes are delivered in the most cost effective and efficient way, on the basis of the best available knowledge and informed engagement on the impacts and the costs of different engineering solutions.

The most recent energy policy update is the Government White Paper entitled *'Ireland's Transition to a Low Carbon Energy Future 2015-2030'* (December, 2015). It sets a 2030 vision of an energy system that would be part of a single physically interconnected EU energy market, which will bring greater security of supply and easier access to cross border flows. It places great value on the relationship with Northern Ireland and commits to continuing the close co-operation on a range of energy matters including the regulation and continued development of the all island single electricity market, energy transmission and specifically the proposed North-South Interconnector.

The *National Renewable Action Plan 2010* sets out the measures the Government considers necessary to achieve its renewable energy targets. It refers to the strategic goal of the 2007 White Paper of 'delivering electricity and gas over efficient, reliable and secure networks'. It also refers to the subsequent commitments of Grid 25, the Government approved strategy for the development of the necessary transmission infrastructure (which includes the North-South Interconnector) to support national targets and a more sustainable long term electricity supply.

The *Sustainable Energy Authority of Ireland (SEAI) Strategic Plan 2010-2015* seeks to make Ireland a global leader in sustainable energy. It envisages a future where electricity is generated entirely from indigenous renewable sources and where Ireland exports electricity across Europe.

2.3.4. EirGrid's Strategic Plans

The EIS also documents EirGrid's strategic plans published since 2008.

Grid 25 – A Strategy for the Development of Irelands Electricity Grid for a Sustainable and Competitive Future was published in 2008. It recognised that over the next 15-20 years' major change would take place in Ireland's electricity needs. The change would be driven by issues of energy security, competitiveness, climate change and the need to move away from imported fuels. The Strategy provides an outline of how EirGrid plans to develop the transmission network to support long-term sustainable and reliable electricity supply and is cognisant of Government policy of increasing penetration of renewables and of improving energy efficiency and energy savings.

It acknowledges the importance of the north-south interconnector in the context of the All–Island Single Electricity Market and the provision of a strong power corridor between Dublin and Belfast. It set out the reasons for building a 400kV transmission line on the basis that it is more efficient than 220 kV and provides greater power carrying capacity with fewer electricity losses. It acknowledges that Grid 25 is essential to support growth in the regions, to providing a high voltage

bulk power supply for Ireland, to exploit our natural renewable sources of energy, reduce carbon emissions and increase Ireland's connectivity to the European Grid, allowing for both bulk exports/imports of electricity as appropriate.

The *Grid 25 Implementation Programme 2011-2016* provides an overview of how the Grid 25 strategy will be implemented in the short to medium term. It identifies those parts of the transmission system that are likely to be developed over the next five years. The proposed development is identified as a network reinforcement project in Table A1 of Appendix A.

The document entitled *Your Grid, Your Views, Your Tomorrow –A Discussion Paper on Ireland's Grid Development Strategy* was published in March 2015. It reviews the grid development strategy outlined in Grid 25 and acknowledges the changes that have occurred in the intervening period such as the changed economic context and the opportunities offered by advanced transmission technology.

It states that the compelling and clear need for the North –South Interconnector remains. It is identified as a 'Major Project', which is critical to ensuring a safe, secure supply of electricity throughout Ireland. Other benefits will include major cost savings and that significant issues around security of supply particularly in Northern Ireland will be addressed. A key benefit will be the removal of the bottleneck between the two systems, which will enable them to operate together as if they were one network. It will also facilitate greater connection of wind generation which will help achieve Ireland's renewable energy targets. A new 400 kV AC overhead line is identified as the most effective and appropriate solution.

An external peer review of the document and technical appendix was carried out by London Power Associates (LPA) which concluded that 'there is a strong need case for the project and that significant benefits will accrue"

2.3.5. Regional Policy Context

The regional planning guidelines prepared by the dissolved regional authorities continue to have effect until such time as a regional spatial and economic strategy by the respective regional assemblies are prepared and adopted.

The *Border Regional Authority Planning Guidelines 2010-2022* includes Cavan and Monaghan. The guidelines acknowledge (Section 1.11) that electricity is the main energy demand in the Region and that the development of more sustainable, competitive, diverse and secure supplies of electricity to support economic and social development is a key challenge for the Region. It is recognised that extending the network into Northern Ireland and the UK through interconnectors will provide the Region and the Country with a more secure and reliable energy supply. The upgrading of electricity grid infrastructure is a key challenge if the potential for renewable energy generation is to be realised (Section 1.17)

Chapter 5 of the Guidelines (Infrastructure Strategy) recognises the transmission constraint that exists between the two jurisdictions, despite the creation of the single electricity market in November 2007. It is acknowledged that this constraint will be removed following the delivery of the second North-South interconnector. It is noted (Section 5.4.2.3.) that the Border Region forms the important link between the two jurisdictions and that the importance of the future development of the transmission network in the Region cannot be underestimated, with respect to the future development of the islands electricity market and the larger European market.

The Meath-Tyrone 400 kV Interconnection Development is identified as a key project which is critical to the future development of the Region.

> *'The development is required to improve competition by increasing transfer capacity between the two systems, thereby reducing transmission constraints that are currently restricting the efficient performance of the all-island Single Electricity Market. The development will support the development of generation from renewable energy sources and secure security of supply for the north-east,*

along with securing supply on the island by allowing sharing of generation across the island'.

The *Regional and Planning Guidelines for the Greater Dublin Area* include Co. Meath. Chapter 3 Economic Development Strategy notes that economic development within the GDA is dependent on the availability and quality of services and utilities including electricity. It is stated that the *'demand for electricity in the GDA region is expected to increase by over 80% by 2025 and will then be 30% of the demand for the island. Improvements are necessary in regional power infrastructure in order to maintain security of supply, to attract additional industry and to allow for the connection of renewable energy sources to the grid' (Section 3.5.8).*

The Guidelines acknowledge that the future development of the grid and provision of infrastructure to transmit energy from existing and new generators is of vital strategic importance to the GDA, as the primary demand centre in the country. Reference is made to Grid 25 and planned investments within and extending beyond the GDA and the benefits that will accrue from the proposed North-South Interconnector in terms of long term capacity between the Republic of Ireland and Northern Ireland and security of supply /essential transmission grid reinforcement in the North-East.

2.3.6. Local Policy Context

2.3.6.1. Monaghan County Development Plan 2013-2019

The Monaghan CDP recognises the development of secure and reliable energy infrastructure as a key factor for maintaining and promoting growth together with attracting investment to the County. It refers to the prime considerations identified in the NSS, relevant to the Border Region, including the development of energy infrastructure on an all-island basis, the strengthening of energy networks in the West, North West, Border and North Eastern areas in particular and the enhancement of the robustness and choice of energy supplies through improvements to the national grids for electricity and gas.

Objectives of the Plan seek to promote and support energy production from various renewable sources, reduce energy usage and promote energy efficiency in buildings. Also relevant are the following policy objectives in relation to energy infrastructure:

- **ERO 1** - Ensure that all plans and projects relating to energy and renewable resources development are subject to policies AAP1-AAP5 contained within Chapter 4 Environment and Heritage of the Monaghan County Development Plan 2013-2019.
- **ERO 10** – Facilitate electricity and gas infrastructure improvements /installations which will not result in adverse impacts on the natural or built heritage of the county.
- **ERO 12** – Consider the identification of a strategic corridor in the county for major energy infrastructure.

2.3.6.2. Cavan County Development Plan 2014-2020

Policies of the Cavan CDP support the provision of new high voltage electrical infrastructure, including high voltage transformer stations and new overhead transmission power lines. It is recognised that this infrastructure will be required for reinforcement of the transmission network, related to growing electricity demand from existing customers, as well as, the connection of new generation and large demand customers e.g. industry (Section 4.7.1).

The Plan also recognises that overhead lines which transport electricity around the country using 110kV, 220 kV and 400 kV are faster and easier to repair and not subject to excavating activities, however, underground cabling will be encouraged in heavily populated areas, if feasible.

Cavan County Council takes cognisance of the 'Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure' issued by the Department of Communications, Energy and Natural Resources'. Relevant policy objectives include:

- **PIO106** - Where development is of a scale that requires approval under the Strategic Infrastructure Act, 2006, the applicants/ promoters shall include as an integral part of their planning approval/ planning application documentation, a study by a suitably qualified independent person/body demonstrating whether the proposal is incorporating the most appropriate technology available and method of construction including a comprehensive examination (in the case of transmission lines) of the under-grounding of such services. The applicant shall also ensure that planning applications involving the siting of electricity power lines and other overhead cables, consider in full, the impacts of such development on the landscape, nature conservation, archaeology, residential and visual amenity.
- **PIO107** - In routing new overhead power lines, on the grounds of general amenity, and where possible, EirGrid and ESB Networks shall seek to achieve the maximum separation distance to residential and other property generally occupied by human beings while also seeking to avoid, or minimise impact upon, other identified technical and environmental constraints. All proposals for new residential and other development in proximity to existing overhead power lines shall be assessed in reference to the provisions of the Electricity (Supply) (Amendment) (No. 2) Act, 1934 regarding separation distance. Construction works occurring in proximity to power lines shall have regard to relevant published Electricity Supply Board Guidelines such as the "Code of Practice for Avoiding Danger from Overhead Electricity Lines" and other nationally accepted standards or guidelines.
- **PIO108** - To support the infrastructural renewal and development of electricity networks in the County and recognise the development of secure and reliable electricity transmission infrastructure as a key factor for

supporting economic development and attracting investment to the area and to support the infrastructural renewal and development.

- **PIO109** Cognisance will be taken of the 'Code of Practice' between the DECLG and EirGrid (2009).
- **PIO110** To ensure that High Voltage electrical lines must be constructed and monitored in accordance with current "Guidelines of the International Commission on Non-Ionising Radiation Protection (ICNIRP)" and Commission for Energy Regulation (CER).
- **PIO111** To support the undergrounding of HV powerlines, where technically feasible, economically viable and environmentally appropriate.

2.3.6.3. Meath County Development Plan 2013-2019

Chapter 8 (Energy) of the Meath CDP recognises that the availability of energy is of critical importance to the continued development and expansion of employment in Co Meath. With increased residential development and a drive for more industrial, commercial and employment generating uses, it maintains that it will be important to ensure that the capacity of the energy network is sufficient to meet these demands (Section 8.1). It is noted that EirGrid and the ESB have identified a number of major infrastructural projects planned to cater for normal domestic and commercial supply and includes the North-South interconnector and the construction of a second transformer in Woodland Station.

Policies and objectives of the Plan include measures to encourage energy production from renewable sources, initiatives for limiting greenhouse gas emissions through energy efficiency and support for the National Climatic Change Strategy. The Plan also includes the following policies in relation to energy infrastructure

- **EC POL 1** – To facilitate energy infrastructure provision, including the development of renewable sources at suitable locations, so as to provide for the further physical and economic development of Meath.
- **EC POL 11** – To support and facilitate the development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the County.

- **EC POL 12** – To co-operate and liaise with statutory and other energy providers in relation to power generation in order to ensure adequate power capacity for the existing and future needs of the County.
- **EC POL 13** – To ensure that energy transmission infrastructure follows best practice with regard to siting and design particularly to ensure the protection of all important recognised landscapes.
- **EC POL 16** – To require that the location of local energy services such as electricity be underground, where appropriate.
- **EC POL 18** – To generally avoid the location of overhead lines in Natura 2000 sites unless it can be proven that they will not affect the integrity of the site in view of its conservation objectives i.e. by carrying out an appropriate assessment in accordance with Article 6(3) of the E.U Habitats Directive.
- **EC POL 19** – To promote the undergrounding of existing overhead cables and associated equipment where appropriate.
- **EC OBJ 4 –**To seek the delivery of the necessary integration of transmission network requirements to facilitate linkages of renewable energy proposals to the electricity transmission grid in a sustainable and timely manner.

3.0 SUBMISSIONS RECEIVED

Submissions in respect of the application for approval have been received from prescribed bodies, planning authorities, interest groups and members of the public. This section of the report seeks to draw the Board's attention to the significant matters raised by these parties.

3.1. Prescribed Bodies

3.1.1. Department of Arts, Heritage and the Gaeltacht

3.1.1.1. Archaeology

The Department acknowledge that the route selection process has taken into account the avoidance of direct impacts on known sites and monuments. They consider that potential impacts fall into two principal categories, direct physical impacts on previously unidentified subsurface archaeological remains and visual impacts on the visual and visitor amenities of monuments close to the selected route (in particular those that are in the ownership of the Minister for Arts, Heritage and the Gaeltacht).

Physical Impacts

With regard to physical impacts the Department states that the Code of Practice between the Department and EirGrid will ensure that a Project Archaeologist will co-ordinate mitigation responses with the Department should permission be granted. Under the Code of Practice, the Department also recommends that the consultant archaeologist will also clarify all issues with regard to the construction of the individual pylons and installations that remain to be confirmed. Such arrangements can be agreed with the Department in advance of any construction works.

The Department recommend that all ground works associated with the construction works should be archaeologically tested or monitored with the

exception of areas where it is certain that there is no archaeological potential. Where buffer zones around particular monuments have been recommended these should be demarcated by a suitably qualified archaeologist to avoid inadvertent damage.

Impacts on Setting

In terms of impacts on setting, the Department refers to:

- The wide variety of monuments in both study areas, including megalithic tombs, enclosures, ring forts etc., many of which have their own architectural and visual characteristics and make their own visual statement against which the visual impact of the pylons needs to be assessed.
- National Monument sites in the Ownership or Guardianship of the Minister for Arts, Heritage and the Gaeltacht, which not only form part of the archaeological landscape but also have significant tourism amenity value. These include sites such as Bective Abbey, the Hill of Tara and the landscape at Teltown. Co Meath.

The Department states that it is not clear if some of the visual impacts will be acceptable. They argue that the mitigation of impacts on setting has not been identified or properly assessed and that the future amenity potential of the sites involved has not been assessed. The Department requests further information on the extent of impacts on individual monuments and complexes, in particular the impact on the amenity value of the sites in the Ownership or Guardianship of the Minister for Arts, Heritage and the Gaeltacht. With regard to the Hill of Tara, the Department that views from other locations on the hill (in addition to photomontage 68) are also modelled and assessed.

It is also noted that at one location to the west of Tara (in the townlands of Balbrigh and Bective) the proposed line passes within 250m of significant cropmarks that indicate an extensive subsurface barrow complex (a Bronze Age cemetery). These sites are not mentioned or identified in the EIS. It is possible that

this complex of monuments could extend in the direction of Tower 351. The cropmark enclosures and ring ditches appear on Google imagery taken on 12 July 2013. The Department seeks clarification on the extent of research carried out on Google Earth and if this data will be re-assessed in light of the omission.

3.1.1.2. Architectural Heritage

The Department recommends that, during the construction phase of the project, the protection of upstanding structures of architectural heritage should be assessed by a conservation architect or a conservation engineer.

In terms of operational impacts, the main (moderate to significant) impact identified on a protected structure is on St Patrick's Church of Ireland, Ardagh, Co. Monaghan (RPS No 41402713, NIAH No 41402727). It is noted that no specific mitigation measures are set out and the Department recommends that the Board considers whether screening by planting should be conditioned, given that it may have to be specifically designed in light of the competing issue of the significant view and that such planting may be a matter of interests to the relevant stakeholders.

It is noted that two structures of architectural heritage interest, Corvally Presbyterian Church (NIAH No. 41403005) and the former Corvally School (NIAH No 4143004) are not included in the schedule of buildings in Appendix 14.3 of the EIS, although the nearby former manse is (NIAH No 41403014). It is unclear what impact the development may have on the school and church and this needs to be clarified.

The Joint Environmental Report states that the proposed interconnector will have an effect on a number of demesne landscapes, including Brittas, where a significant impact is predicted. The Department state that mitigation measures, whilst proposed, are not precisely defined. The Department refer to other demesnes which will be affected by the development and state:

- For Ardbraccan, it is not clear if the existing trees and walls screening at this location is considered sufficient to mitigate the operational impact or if additional screening will be recommended.
- Any mitigation impacts on demesnes should be identified and appropriately specified.

With regard to Bective Abbey, a monument in State care, they state that the extent of impact on this is unclear from the documentation submitted.

3.1.1.3. Nature Conservation

The Department state that whilst the EIS and the NIS deal extensively with the issue of bird flight lines, particularly between roosting and feeding areas, the issue of bird migration routes also need to be considered, including Whooper Swan, Greenland White-fronted Goose, Greylag Goose and Light-bellied Brent Goose.

It is the view of the Department, that an Bord Pleanála when carrying out an appropriate assessment, should consider ex-situ impacts on migratory bird species. Therefore, Natura 2000 sites further afield, such as Wexford Harbour and Slobs SPA, need to be considered in the AA. An Bord Pleanála may need to establish if further information is required on this issue.

3.1.1.4. Mitigation measures and data gaps

The Department refers to the proposed use of flight diverters (high impact grey PVC). They state:

- These flight diverters seem to be at odds with the type of mitigation measures outlined in EirGrid's Guidelines,
- The efficacy of such measures has not been established,
- The Board should ensure that it has been supplied with adequate scientific information to inform its assessment as to the effectiveness of the proposed diverters and the effect on the environment, and
- In order to confirm the effectiveness or otherwise of the relevant mitigation measures, it would be useful if a targeted monitoring programme was

implemented. The findings of such a programme would inform future developments.

Having regard to the above, the Department state that cognisance should be taken of Circular Letter PD 2/07 and NPWS 1/07 Compliance Conditions in respect of Developments requiring (1) Environmental Impact Assessment; or (2) having potential impacts on Natura 2000 sites. The Department state that further information may be required on the methodology of the proposed monitoring, in particular to ensure that the removal of fatalities by foxes etc., has been considered in any such methodology and what action will be taken by the applicant or the planning authority in the event of monitoring showing a negative impact on bird populations due to collisions.

3.1.1.5. Conservation Objectives

Section 5.1.8 of the NIS appears to quote both generic and site specific conservation objectives for Dundalk Bay SPA. There are currently joint site specific objectives for both the SAC and SPA dated July 19 2011. This version should be used for appropriate assessment of plans/projects that may affect European sites.

3.1.1.6. Collision data

Section 6.5.3.3.1.1 of Volume 3D and section 5.2.3 of the NIS refer to signs of swan collisions with distribution lines. No attempt has been made to put a quantitative value on the number of fatalities that could occur as a result of the proposed development. Data should be quantitative in order to establish whether it will give rise to significant effect and conclusions should be substantiated with and supported by scientific information and analysis.

3.1.1.7. Cumulative impacts

A number of overhead lines and wind farms were considered for cumulative effects including the Emlagh windfarm. However, without an estimate of the cumulative number of fatalities that could occur, it is the Department's view that the cumulative effect of fatalities due to bird collisions has not been assessed.

3.1.1.8. Tree and Hedgerow trimming

It is stated in the EIS that hedgerow and tree trimming should be undertaken outside the bird nesting period and that all birds and their nesting places are protected under the Wildlife Acts. It is also stated that there are exceptions for exempted developments. This exemption does not include killing or destroying birds and their eggs and nests. This can only be done under licence from NPWS. The amendment to Section 22(5)(h) of the Wildlife Acts made by SI 397 of 1985 should be referenced to in this instance.

3.1.1.9. Water Quality

The Department state that, particularly with regard to Natura 2000 sites, the Board should ensure that the outline CEMP presented in Appendix 7.1 of Volume 3B contains enough details of the proposed measures to allow a complete, precise and definitive appropriate assessment and ensure protection of water quality. The Departments notes from Appendix 1 of the NTS that a detailed CEMP will be prepared by the contractor and agreed with the ESB and subsequently with local and relevant prescribed authorities. An Bord Pleanála should take cognisance of Circular Letter PD 2/07 and NPWS 1/07 as referred to above.

3.1.1.10. Positions of pylons and survey work

It is noted that since the time of the last application, EirGrid has taken on board previous concerns of the Department with regard to the placement of towers in hedgerows. It is noted that where EirGrid were unable to access the land, they have proposed to place towers on agricultural land rather than in the hedgerows, for the purpose of reducing impacts on biodiversity and have generally tried to avoid hedgerows, which is generally a welcome development.

It is noted that EirGrid have not undertaken ecological surveys of all the land that may be affected by the proposed development. It is also noted that because of the amount of time that may pass between the time of application and the commencement of construction, EirGrid propose to undertake a range of pre-construction surveys. The Department would welcome clarification from An Bord Pleanála as to how it would intend to manage any significant ecological issues that may arise post-consent, which could have potentially affected the conclusions of the Board's assessment. In this regard the attention of the Board is again brought to Circular Letter PD 2/07 and NPWS 1/07.

3.1.2. Minister for Communications, Energy and Natural Resources

The Department of Communications, Energy and Natural Resources (DCENR) draws the attention of the Board to the Government's policy position in relation to the development of the north-south 400kV Interconnection Development and highlights the critical importance of this project in the context of the Government's energy policy and its economic and climate change objectives.

3.1.2.1. Energy Policy Context for Support of the Project

The July 2012 Government Policy Statement on the *Strategic Importance of Transmission and Other Energy Infrastructure* re-affirmed the need for the development and renewal of energy networks in order to meet economic and social goals. The Statement confirmed that the Government had mandated the State owned network companies to deliver the State's network investment programmes in the most cost efficient and timely way possible in the interests of all energy consumers who need the investment and who also pay for it. This endorsement was subject to adherence by the infrastructure providers to national and international standards for design and construction and to their being planned and executed with appropriate community consultation. Developing and upgrading of grid infrastructure, including planned interconnection with neighbouring electricity systems, underpins regional economic growth and job creation objectives and it will enable delivery of the Government's renewable energy ambitions in line with Ireland's EU targets. The Statement also underlined the

importance of EirGrid's Grid 25 programme as the most important investment in Ireland's transmission system for several generations and that it will position our energy system for decades to come.

Ireland's security of supply and network development objectives are also key European energy policy priorities. This has been reflected in the European Energy Infrastructure Regulation and more recently in the Energy Union. The EU has recently prioritised the establishment of the Energy Union, which will lead to greater integration of member state energy markets. It also places emphasis on ensuring that major energy infrastructure projects are delivered when and where needed.

The new energy policy framework (White Paper) will set out Ireland's future energy policy to 2030, with a view to 2050. It will be the conclusion of a process that began with the publication of the Green Paper on Energy Policy in Ireland in May 2014. The Government's policy objective on planning and implementing essential energy infrastructure is to ensure that Ireland continues to maintain and develop integrated energy infrastructure systems which make energy available with minimal risk of supply disruption, to meet the needs of the Irish consumer. A consistent and reliable supply is also critical to attracting new industry facilitating economic renewal and reducing costs to consumers and business.

The planned North-South Interconnector development is central to the more efficient running of the all-island Single Electricity Market (SEM), under which electricity suppliers in Ireland and Northern Ireland compete for customers. The completion of the European Internal Energy Market (IEM), a priority under the Energy Union, should bring about deeper integration of energy markets. Ireland and Northern Ireland are now forging ahead with the creation of a new wholesale electricity market by 2017 that will achieve ever greater integration with the IEM. The current reliance however on a single North-South interconnector is a significant constraint to realising the full benefits of SEM.

3.1.2.2. Critical Importance of the North-South Interconnection to Achieving Infrastructure and National Objectives

Insufficient interconnection between the North and South of Ireland is preventing the full benefits of the all-island market being realised for consumers. The CER have noted that the absence of the interconnector is costing the consumer significantly and this cost will continue to rise going forward. The cost and overall economic benefits that would flow from a north-south interconnector have also been outlined by the Northern Ireland Utility Regulator at an Oireachtas meeting in July 2015.

The DCENR shares the concern of CER that this cost is set to rise significantly and that the north-south interconnector should be developed as early as possible to minimise the cost from a consumer perspective. The ESRI reached a similar conclusion noting that building the interconnector would reduce total system costs and the emissions produced by the Irish electricity system.

The development is critical to ensuring a safe, secure supply of electricity throughout the island of Ireland. The existing North South link is a major point of congestion on the network. A key benefit of a second interconnector will be the removal of constraints and congestion between the two systems. The interconnector will enable the two systems to operate as if they were one network across the island, for the benefit of residents and businesses in both jurisdictions.

The Regulators, North and South, and the ESRI, DCENR expect that the second interconnector will bring about significant cost saving for consumers across the island of Ireland. Larger electricity systems operate more efficiently than smaller ones, so operating the two systems as if they were one network will bring cost savings for consumers.

3.1.2.3. Clear Need for the Project Established in the Revised Grid 25 Strategy

Grid 25 was designed to facilitate more sustainable, competitive and secure power supplies in support of economic and social development and to help Ireland achieve its 2020 renewable energy targets. The latest review of the grid strategy was published earlier this year in the form of a draft grid development strategy '*Your Grid, Your Views, Your Tomorrow'*. Following discussions with DCENR the review process was expanded to include an independent review, conducted by London Power Associates (LPA) to verify the technical analysis underpinning the review and an independent analysis of the economic impacts of Grid 25 by Indecon. This comprehensive review of the national grid development strategy demonstrates the absolute importance attached to the strategy being underpinned by sound technical analysis of all relevant data.

The draft strategy noted the fact that Northern Ireland is likely to need to import more electricity from Ireland during times of peak demand in the next decade, in order to balance supply and demand and to maintain security of supply. Accordingly, the draft strategy found that there remains a clear need for the North-South transmission line, and that the existing proposal for a 400kV overhead line remains the most appropriate solution for the project.

3.1.2.4. Independent Expert Panel and Other Reports

DCENR is aware that the proposed North South interconnector development has been the subject of public scrutiny and debate for some time, with a focus on whether it should be undergrounded. Several independent reports dating back from 2008 to the most recent finding from the Independent Expert Panel have been commissioned, completed and published.

The most prominent finding across the report is that undergrounding the project would be more expensive. The international expert commission's report published in 2012 concluded that a high voltage direct current underground solution (HVDC) would be three times more expensive that an overhead option. The CER has stated that the view expressed by the commission in this regard and internal

precedents show that a HVDC option would give less function that an AC cable, so one would pay more but get less.

3.1.2.5. Designation of the Project as a Project of Common Interest

The project was designated a Project of Common Interest by the European Commission in October 2013 under the European Energy Infrastructure Regulation. PCI's are energy projects deemed by the European Commission to be of strategic, trans-boundary importance, are deemed necessary for EU energy policy and are allocated the status of the highest national significance.

3.1.2.6. Conclusion

The Department concludes that a resilient and well connected energy infrastructure is vital for Europe's economic wellbeing and will assist in creating the conditions for the market to respond to the needs of EU energy consumers, particularly those in peripheral energy markets such as Ireland. It is also key to economic renewal and growth. The three pillars of energy policy at EU level and in Ireland are security of supply, competitiveness and sustainability. Grid development is an essential pre-requisite to achieving these objectives and to meeting our EU and international climate change objectives.

The North-South Interconnector development is a key project in delivering these objectives as it will underpin future economic growth, provide the necessary grid infrastructure for renewable electricity integration and ensure secure electricity supplies both in the region, in Ireland and on an all-island basis. The Minister for Communications, energy and Natural Resources therefore sees the development of this project as an urgent and important priority and welcomes An Bord Pleanála's consideration on the development of this key strategic national asset.

3.1.3. Transport Infrastructure Ireland

The proposed route of the North-South Interconnector traverses the existing N2, the M3 and the N52. It also traverses the line of the Leinster Orbital Route (LOR), formerly known as the Outer Orbital Route, between Navan and Trim. The proposal to develop the route is included in both the Meath County Development Plan and as a key objective of the Regional Planning Guidelines for the Greater Dublin Area.

Whilst the Authority brought the LOR to the attention of the project promoters, they state the EIS submitted in support of the application does not appear to make substantial reference to the LOR or how the interface between the proposed power line and the LOR will be addressed. The Authority requests that the Board consider the following:

- That the required safety and standards of the national road network is maintained through appropriate best practice construction and approval methods.
- That the proposed works do not impinge on the M3 motorway and the Concession Operator. The Authority therefore requests that the NRA, the relevant planning authority and the M3 Concession Company are consulted and their agreement sought in advance of works being undertaken in proximity to the M3.
- With specific regard to the Leinster Orbital Route, the Authority requests that the Board includes the following condition:

  That the proposed develop/scheme promoter shall consult with the TII and agree detailed design specifications for the proposed 400 kV line in relation to the LOR in advance of any works along the route between Pylons 342 and 354.
- The Authority also requests that the Board satisfy itself that the proposed power cables between Pylons 342 and 354 provide suitable vertical clearance for a future Leinster Orbital Route which may be at a level of 7.5m above the general ground level.

3.1.4. Failte Ireland

Ireland's landscape has been the cornerstone of international tourism marketing campaigns for decades. International visitors to Ireland consistently rate scenery as an important reason for their trip. As the Irish landscape is one of the primary reasons for visiting the country, it is essential that the quality, character and distinctiveness of this valuable resource is protected.

The proposed development is located in the northern part of Ireland's Ancient east, one of the three overarching brand propositions for Ireland. This proposition is of scale and singularity which would provide the necessary 'cut-through' in the international market place. It is also a platform upon which Ireland can present a portfolio of world class visitor experiences.

The character and the various aspects of the cultural heritage of the area, within the vicinity of the proposed interconnector, are the main tourism amenities that are pertinent to the proposed development. While potential impacts on tourism have been considered as part of the 'Human Beings' chapter of the EIS, the landscape character of the assessment relates primarily to impacts on residential dwellings and does not appropriately make the link or consider the impact on the landscape character of the area and its associated importance for tourism. Tourism factors (and in particular the landscape) have been insufficiently developed in the analysis and consequently the potential impacts of this development on tourism have not been rigorously assessed.

A further evaluation of the potential impact of the proposed development on landscape character of the area should be undertaken in line with the commitments made in the EirGrid document '*Your Grid, Your Views, Your Tomorrow - Responding to Tourism Concerns*'.

3.1.5. An Taisce

3.1.5.1. Onus on EirGrid to Justify the Project and Consider Alternatives

An Taisce argue that the project needs to demonstrate public consultation in accordance with Article 6(4) of the Aarhus Convention, including all the preliminary decisions made in relation to the project; in order to *'provide for early public participation, when all options are open and effective public participation can take place'*

There is a preliminary onus on the applicant to justify this strategic infrastructure application project in terms of the need for a new 400kV line; the route selection and the use of overhead lines as opposed to an underground option. Subject to these three preliminary issues being addressed, there is a need to consider all of the impacts defined under the EIS directive including impact on human well-being together with socio-economic effects on local residential amenity, ecology, landscape and cultural heritage. The adequacy of the alternatives considered by the applicant needs to be properly assessed.

3.1.5.2. Strategic Energy Policy Considerations

An Taisce state that they have pointed out in repeated submissions to Government on climate and energy that future energy policy and projects, and consideration of grid capacity and management must be integrated with a number of key elements of an overall national energy strategy, including reducing primary energy demand, eliminating the most carbon intensive energy sources, achieving the optimum range of renewable or low carbon energy sources etc. Whilst the application is lodged as a Strategic Infrastructure proposal it in not integrated with the range of strategic energy actions required for the region.

An Taisce argue that objective to achieve a 40% renewable target by 2020 and higher targets to 2030 is not sufficient unless accompanied by demand reduction. Unless efficiency measures are undertaken the renewable target will become a 'moving' one based on a percentage of total electricity generation and does not address the risk of future increases in primary energy demand.

An Taisce state that the EirGrid 25 Consultation document, justifying grid expansion including the proposed interconnector, couples' electricity demand with economic volatility. With improved economic conditions the demand for electricity, which had fallen during the recession, has now started to increase. If Ireland is to reduce emissions, demand reduction through efficiency must play a parallel role to the decarbonisation of energy production. Proceeding with individual energy projects and initiatives is ill advised without such as strategy.

3.1.5.3. Consideration of Landscape Impacts

Impacts on landscape and cultural heritage and application of the European Landscape Convention (ELC) are key considerations in this application. Under the convention it is not enough to consider landscapes which are simply outstanding or beautiful, the ELC sets a requirement to survey, record and understand the everyday landscape. Whilst the National Landscape Strategy was published in 2015, it does not contain any provision for landscape protection or for managing or planning the landscape. Whereas local authorities are entitled to designate Landscape Conservation Areas under the Planning Acts, this is discretionary and not implemented across councils. There is no evidence that the National Landscape Strategy will effect any change in this situation, as shown by the failure of Meath Co. Council to put in place a proposal by the Heritage Council that the Tara area be made a Landscape Conservation Area.

This means that the precautionary principle should be adopted by the Board, a principle set out in the Treaty of the Functioning of the EU, "TFEU" Article 191 which underpins the EIA Directive under which the application is required to be assessed.

The major part of the application affects the Drumlin landscape of Co Monaghan extending into Co Meath. It is a particularly well defined drumlin landscape.

An area of particular sensitivity affected by the proposal is the crossing point of the River Blackwater near Donough Patrick (*sic*) which has a cluster of archaeological

monuments, and the River Boyne to the west of Bective Bridge and Abbey. Both of these river valleys have both landscape and cultural heritage sensitivity.

The proposal affects the landscape setting of a number of country houses which are on the DAHG National Inventory of Historic gardens and designed landscapes including Whitewood, and Brittas House, Nobber and Cruicetown Kells. Public policy should seek to protect the wellbeing of communities both urban and rural. The maintenance of an attractive rural environment is both a social and economic consideration which needs to be assessed in relation to any development or infrastructural proposal. The rural landscape, archaeological sites and historic houses in their designed landscape setting in the area, are a community, cultural and economic asset which need to be protected.

3.1.5.4. Cumulative Impact with 'Emlagh' Wind Application

There is a need to consider the cumulative impact of this project with another before the Board, namely the wind turbine project to the east of Nobber.

3.1.6. Eastern and Midlands Regional Assembly

The Regional Assembly state that the Regional Planning Guidelines for the Greater Dublin Area (which includes Meath) support the principle of a North-South Electricity supply interconnector. However, the Members of the Regional Assembly have significant concerns with the proposal as presented. The impact of the proposed pylons on health, agriculture, one-off housing and landscape and the lack of proposal to underground the lines are issues that should be taken into consideration in the assessment of the proposal by An Bord Pleanála.

3.1.7. Northern and Western Regional Assembly

The Assembly state that it is accepted almost universally that a North-South Interconnector is needed to improve electricity supply on the island and consistent with stated national, regional and local planning policies. They argue that consideration of the application will require that a balance be struck between the policies that encapsulate support for the development in the RPG's and other

policies which support tourism and retention of unspoilt landscapes, protection of natural heritage, built heritage and landscape character views and prospects.

In assessing the application, the Board is asked to consider the following;

- Impacts on the private amenity space of dwellings in the vicinity of the route and details of separation distances from alignment. Separate analysis and details of the separation distances from other sensitive land uses such as schools, childcare facilities and nursing homes.
- Management of waste arising from the construction process in the context of the emerging policy for future landfill disposal in the Draft Waste Management Plan for the Connacht/Ulster Region. The application may need to be more explicit on waste disposal, specifically on locations and environmental impacts.
- Micro-siting is not being sought as part of the application and accordingly specific on site investigation for all transmission towers may need to be completed as part of the application.
- The location of new or intensified access points to the public road network and the implications for traffic safety may need to be provided in greater detail. This would increase public knowledge of impacts and the proper planning of the project.
- The maximisation of undergrounding to minimise impacts on the amenity of residents along the line of the route. A full route analysis of the impacts from the undergrounding option should be carried out.

3.1.8. Inland Fisheries Ireland

Inland Fisheries Ireland (IFI) state that the proposed development crosses a number of river catchments in the Eastern, Neagh Bann and North West River Basin Districts. It therefore has the potential to impact on a wide range of important fisheries waters including areas designated as SAC's, angling waters, adult holding areas, nursery and spawning areas etc. The catchments contain valuable fishery habitat with stocks of salmonid and coarse fish. Some contain species protected under the Habitats Directive including Atlantic Salmon and

Lamprey. The River Boyne and the Blackwater are proposed SAC's with populations of Atlantic Salmon and Lamprey.

IFI state that the Outline Construction Environmental Management Plan appears to place an emphasis on protecting watercourses within catchments of European sites. They argue that this protection should include all watercourses, irrespective of their designation as many hold species that are designated under the EU Habitats Directive i.e. Salmon and lamprey (river, sea and brook) which are listed as Annex 11 species.

In order to protect fisheries waters, IFI recommend certain work practices, including the following:

- All natural watercourses to be traversed during site development and road construction works should be bridged prior to commencement. If temporary crossing structures are required these require approval by IFI.
- In the case of towers adjacent to watercourses, detailed design and construction in consultation with IFI.
- Works in-rivers, streams and watercourses to be carried out during the period July to September (except in exceptional circumstances and with the agreement of IFI).
- Adequate assessment of soils at tower locations and along access routes.
- Incorporation of best practices into construction methods to minimise discharge of silt/suspended solids to waters.
- Use of pre-cast concrete where possible, or when cast-in-place concrete is required, work should be carried out in a dry and isolated area away from any water that may enter the drainage network, for a period sufficient to cure the concrete.
- Provision of specific controlled and environmentally safe vehicle washout areas.
- Storage of fuels/oils etc. in secure bunded areas, designed to recommended practice.

3.1.9. Geological Survey of Ireland

The GSI notes the on-going consultation with TOBIN Consulting Engineers since 2011 and EirGrid since 2013 in respect of the proposed development. The Irish Geological Heritage sites designated as County Geological Sites have been covered and no impact is anticipated. The GSI has no further comments to make on the proposed development.

3.1.10. Irish Water

Irish Water state that the proposed development will traverse Irish Water assets and that the construction of the towers may impact on some of these assets. They request that the applicant be required engage with Irish Water at the design stage, in order to determine both the potential impacts of the proposed works on Irish Water assets and to agree appropriate mitigation measures where necessary. They recommend that a method statement should be prepared setting out how it is proposed to protect assets from damage and that a Communications Strategy is provided setting out a method to notify and engage with Irish Water regarding the works programme.

3.1.11. Health Service Executive

3.1.11.1. Electromagnetic Fields

Based on the weight of research in the field, the HSE is satisfied that as long as the development complies at all times with the international exposure limit guidelines as established by the INCIRP, there will be adequate protection for the public from any electromagnetic field sources.

3.1.11.2. Drinking Water Supplies

The HSE state that all wells and boreholes in the vicinity of the pylons should be identified prior to construction. They note that information in the EIS appears to be taken from GSI data and is not specific to tower locations. The HSE recommended that specific details of groundwater monitoring be included in the CEMP for approval prior to construction. Specific details of mitigation for affected

householders should their water supply be adversely affected should also be specified. All other mitigation measures to protect the water environment should be implemented in full.

3.1.11.3. Contaminated land

No significant potential contamination risk was identified in the EIS. The EIS outlines the procedures to be followed should contaminated land be unexpectedly encountered. Subject to compliance with these mitigation measures there are no further concerns on this matter.

3.1.11.4. Pest control

Potential pest control issues arising from construction were not identified in the EIS. It is recommended that a rodent control programme be included in the CEMP to address and alleviate any potential issues arising from construction works.

3.1.11.5. Complaints procedure

It is recommended that a formal complaints procedure should be outlined in the CEMP to resolve any issues or community concerns in relation to traffic, dust, noise or nuisance complaints, which should be agreed and approved prior to construction.

3.1.11.6. Noise/Vibration

Mitigation measures have been outlined with regard to construction activities and mitigation measures should be included in the CEMP.

3.1.12. DOE Strategic Planning Division Northern Ireland

The Department confirmed that in compliance with the EIA Regulations it had undertaken consultation with relevant authorities in Northern Ireland, including DETI Energy Branch, DARD River Agency, Tourism NI, NI Water, DCAL Inland Fisheries and Northern Ireland Environmental Agency. No comment was received from Tourism NI and NI Water.

3.1.12.1. Department of Enterprise, Trade and Investment (DETI)

DETI's strategic aim is for a more secure and sustainable energy system where energy is as competitively priced as possible, alongside robust security of supply. It is supportive of the proposal to further connect the all-Island electricity market. It considers that the delivery of the project, which has EU Project of Common Interest designation in recognition of its strategic importance to achievement of EU energy policy, will deliver long-term security of electricity supply to Northern Ireland, increase the efficiency of the wholesale electricity market, apply downward pressure on pricing and facilitate transmission of higher levels of renewable electricity generation in the market.

3.1.12.2. Department of Agriculture and Rural Development (Rivers Agency)

It states that if the temporary deposition of materials on the floodplain during construction along with the timing and duration of the works is managed to minimise lost storage volumes then this will have no effect on flood risk or drainage in Northern Ireland.

It is noted that under the terms of Schedule 6 of the Drainage (Northern Ireland) Order 1973 the applicant must submit to Rivers Agency, for its consent for any proposal to carry out works which might affect a watercourse.

3.1.12.3. Department of Culture, Arts and Culture (DCAL)

The Inland Fisheries Group notes that the transmission line runs through the Blackwater and Corr catchments. The Blackwater and its tributaries support populations of salmonids, salmon, brown trout and eel which hold a considerable nature conservation and biodiversity value and provide a valuable recreational resource in the form of angling opportunities. The operation of the overhead line is unlikely to impact on fisheries. During construction there is a risk that suspended solids, construction materials from ground and preparation works and other pollution could enter watercourses to the detriment of aquatic ecology and fishery interest.

Special consideration should be given to the placing of access roads and associated works so that impacts to watercourses are minimised. Construction activity can impact not only on the immediate area but also significant distances downstream. Where crossings of watercourses are unavoidable possible impacts on fish passage should also be assessed and permission sought from the relevant authorities to install temporary or permanent culverts.

All works near watercourses should be carried out in line with guidance as described in the Pollution Prevention Guidelines 5 (Works In, Near or Liable to Affect Watercourses). Storm water should not be discharged to nearby watercourses unless first passed through comprehensive pollution interception and flow attenuation measures in line with SUDS principles.

The applicant should be made aware that it is an offence under section 47 of the Fisheries Act (Northern Ireland) 1966 to cause pollution which is subsequently shown to have a deleterious effect on fish stocks.

3.1.12.4. DOE (Planning Response Team)

The following comments are made by the DoE (Planning Response Team):

- Archaeology and Built Heritage – The Historic Buildings Unit (HBU)notes that one NISMR site ARM 023:004 will suffer a ‘moderate negative’ impact as result of the proposal. It accepts the mitigation measures proposed as well as those proposed for the continuation of the overhead transmission line to Moy, Co. Tyrone. On the basis of the information submitted HBU is content with the proposal.
- Drainage and Water - The Water Management Unit has considered the impacts of the proposed transboundary development on the surface water environment and refers to standing advice.
- Land, Soil and Air – Waste Management have considered the transboundary impacts of the proposal on the aquatic environment and on the basis of the information provided is content with the proposal without conditions.
- Natural Heritage and Conservation Areas – The Natural Environment Division is content with the proposal subject to adherence to the mitigation measures

outlined in Chapter 11 of Volume 3B of the EIS and all additional submitted information.

- The impacts of the proposal on other Natural Heritage interests and on the basis of the information provided is content with the proposal.
- Landscape Architects have considered the submitted information and are content with the proposal.

3.1.13. Armagh City Banbridge and Craigavon Borough Council

This Borough Council notes that part of the interconnector will run through vast parts of the Borough from Derrynooose through to Moy. The Council notes the opposition of the legacy Council (Armagh City and District Council) and also opposes the project in its current form. The Council calls on the Governments both North and South, the Utility Regulators and the power companies to listen to the concerns of local residents and businesses and have the project undergrounded.

3.2. Planning Authorities

3.2.1. Monaghan County Council

3.2.1.1. Principle of proposal

The submission by Monaghan County Council notes that the proposed development is broadly consistent with EU, National, Regional and local polices in respect of energy development.

3.2.1.2. Alternatives

It is considered that there is limited information in the EIS to justify the interconnector being taken through Co. Monaghan.

3.2.1.3. Impact on landscape heritage

It is considered that insufficient consideration has been given to the visual impact of the development on the landscape having regard to the relevant objectives and policies of the Monaghan County Development Plan and the County Monaghan Landscape Character Assessment. The Landscape Character Assessment

specifically refers to the potential impacts of electricity transmission lines on the landscape.

Many of the towers are positioned on top of or near to the crown of drumlins and the line also traverses significant ridges. This has an obvious consequence in relation to the prominence of the proposed development over long range views. It also has the effect of increasing the dominance of the proposed structures in the landscape over short term views. There are particular concerns in relation to 60 no. towers which are either located in elevated or exposed positions or are close to scenic landscapes or landscape features such as lakes and wetlands.

The EIS has failed to justify the positioning of the towers in particular locations in the local landscape that are considered visually obtrusive and has not given due regard to objective LP01 and policies LPP3 and LPP3 of the Monaghan County Development Plan 2013-2019. Whilst it is necessary to balance the visual impact of the proposed development with other issues such as proximity to existing and permitted dwelling, impacts upon archaeological and architectural structures and impact upon sites of bio diversity, greater detail is required to justify the location of each tower on or near the upper reaches of drumlin and elevated ridges and the reason why these towers could not be relocated down slope or rerouted around drumlins or ridges to reduce their prominence in the landscape or on particular elements of the landscape. The route should be revised to lessen its visual impact.

There are also some concerns regarding the photomontages which are part of the EIS. Some of the identified critical views underestimate the views where visibility of the landscape and proposed development are restricted (9, 10, 19 and 35). Other photomontages do not adequately portray the legibility of the towers in the landscape. For example, the towers are not very legible in critical views 6, 9, 23 and 25 where it would expect that the towers would be more noticeable than portrayed. Other examples are Tower 147 in view 18, Tower 170 in view 25, Tower 182 and 183 in view 27. It is expected that these towers would be more legible in the landscape. There would also appear to be inaccuracies in the imposition of the towers in the photomontages e.g. Tower 170 in view 26 appears to be in the wrong location.

Of the four alternative tower designs considered, the C-IVI tower selected by the applicant, would have the least visual impact.

3.2.1.4. Impacts upon areas of amenity

The setting of Lough Muckno and Environs Area of Primary Amenity Value has potential to be affected by the proposed development. Although there is potential for views from Sliabh Beagh and Bragan Mountain Area of Primary Amenity Value to be affected, this would be very limited and would relate to views south from these areas.

The setting of Mullyash Mountain Area has the greatest potential of the designated Areas of Secondary Amenity Value to be affected by the proposed development as well as Lough Major and Environs and to a lesser extent Castleshane Woods.

It is considered that the EIS has adequately assessed the potential for impacts on the Areas of Primary and Secondary Amenity designated in the Monaghan County Development Plan 2013-2019.

3.2.1.5. Impacts upon views/prospects

The proposed development passes within range of a number of scenic routes designated in the development plan. There are concerns that the impact of the proposed development upon the views from the scenic routes have not been adequately portrayed in the EIS. The proposed development will have significant visual impact upon the views from scenic routes SV22 and SV23 and moderate visual impact from scenic routes SV12-14 and SV21. The EIS does not indicate that any necessary mitigation measures such as relocation or reduction in height of towers has been included to lessen the visual impact of the proposed development on these scenic routes.

3.2.1.6. Impact upon lakes and their environs

The proposed development will directly and adversely affect the setting of a number of lakes and their environs to varying degrees. In a number of instances, the development will be located between the road and the lake specifically contravening Policy AVP2 of the Plan. The EIS has failed to properly assess the visual impact of the proposed development on the setting of the lakes and their environs and mitigation measures have not been applied.

3.2.1.7. Impact upon trees/hedgerow

The proposed development is sufficiently removed from any Trees of Special Amenity Value designated in the Plan. Whilst it is noted that efforts have been made to avoid locating towers in hedgerows, it is noted that mature trees and hedgerows will be removed at Towers 112, 140, 143 and 202. A clearance corridor of up to 74m is also mentioned. There is no justification provided in the EIS for such a clearance area, particularly when the falling distance of most trees would be in the range of 8-14m. Further details on clearance areas is required.

It is considered that the EIS has adequately assessed the impact of the proposed development upon trees/hedgerows along its route, however specific information is required on field boundary hedgerow removal to facilitate the widening of the existing laneways or the creation of a new 4m wide access tracks to the towers in the construction period, particularly in regard to cumulative impact.

3.2.1.8. Impact upon biodiversity

It is noted that 90% of the towers are located on improved agricultural land. Potential impacts on biodiversity from the proposed development have been largely mitigated by route selection, avoidance of sensitive habitats (including wetlands) and by design. The route avoids most of the wetlands and where a wetland occurs along the route, the towers are for the most part not on the wetland itself but on the adjoining land and the mapped access routes also avoids them. There may remain localised hydrological considerations/impacts for some wetland sites close to the alignment, which require further assessment.

Between Towers 175-176 there will be a loss of 0.2 ha of wet woodland. This small spur joins to the wooded Bocks Lough to the west. An ecological assessment of this site should be undertaken to assess the impacts of the proposed development and adjoining habitat. It should be checked for protected and rare species and hydrological impacts.

Raferagh Fen (East of Tower 198) is a large wetland complex of national importance for dragonflies. The corridor avoids the site completely and the impact remains neutral on the site ecology. Any proposed adjacent activities such as excavation and construction need to be assessed for their potential impacts on overall site hydrology and water quality, in light of the dragonfly population and the possible existence of EU habitats on site. Corlea Bog is also of national importance and while the towers are located outside the site, it is over sailed by the development. There may remain localised hydrological considerations/impacts for the site.

There are a number of areas in the county where the environmental and heritage considerations combine to create particularly sensitive landscapes and where impacts could combine to create a more significant impact than noted in the individual chapters.

In respect of impact on Whopper Swan, high visibility flight diverters should be used and monitoring should take place for a period of at least five years post construction. The use of ‘grey’ colour diverters is proposed. The colour should be reconsidered to ensure they are visible during times of poor visibility. It is also recommended that additional areas of the line are marked, even where there has been less swan traffic/flight lines noted in the past few years.

3.2.1.9. Impacts upon architectural and built heritage

Although the proposed development passes in the proximity of a number of protected structures and historic gardens, it is considered that it will have limited impact upon the integrity or setting of these structures. The main sites for

consideration are Tully House and Shantonagh House. Towers 170-175 cross these two demesnes. Whilst the EIS states that 'there will be a slight negative permanent impact upon these historic demesnes', it does not provide a rationale for this assessment. Landscape maps should be provided showing the locations of the towers in these historic demesnes and areas of industrial heritage associated with milling such as Reduff Mill which is of particular note. The information should be supplemented with a topographical analysis and impact of the OHL on this landscape should be clearly assessed.

3.2.1.10. Impacts on archaeology

Co. Monaghan is situated between the royal site at Tara and Emain Macha or Navan Fort in Armagh and thus Monaghan's archaeological heritage has a regional context.

There are numerous megalithic tombs recorded in Co. Monaghan and in adjacent counties of Cavan and Louth. On the proposed route there is a particular cluster of megalithic tombs in the area from Cornamucklagh South going northwards to Lennan. There may be added potential for archaeological evidence of Neolithic settlement or other monuments in this area. There is another cluster in the north east of the county around Lemgare.

Monaghan County Council has been leading a regional Black Pig's Dyke project since 2014. This Bronze Age or Iron Age fortification is a recorded monument in the RMP and there are obvious remains along some of its length in Co. Monaghan. Although its location in this part of the county is not apparent in the present day, it should be noted that remains between the east and west portions may exist between the RMP squares 24 and 25.

It is noted that the location of the towers avoids known archaeological sites. However, there may be numerous other archaeological sites in close proximity to the development such as unrecorded Bronze Age archaeological sites (which are well represented in Co Cavan and Louth).

No imagery suitable for assessing the nature and extent of impacts on monuments has been provided. Although reference is made to the use of LIDAR imagery, no images are supplied for analysis and information.

The archaeological information provided concentrates on sites rather than on the archaeological landscape. Additional information should be provided on significant historic landscapes and the landscape setting of the monuments, their Ordnance Datum and the Ordnance Datum of the proposed towers.

MO027-077 at Corrinenty has the potential to be impacted due to the replacement of the pole set on the existing line, which is 20m from the centre of the enclosure. This seems to be the most likely possibility of finding unrecorded archaeology. The views from Lennan megalith (MO019-016) are particularly scenic and although the route will be 210m to the east of the monument, this will have a significant and permanent impact on the monument. In addition, MO014-022 should be demarcated with a buffer during construction and access works.

A full photographic record of all archaeological sites which are assessed to have permanent operational impacts (Section 14.5.4.1 of Volume 3C of the EIS) should be undertaken by the applicant prior to works commencing, as part of the mitigation. This should concentrate on the monuments and their setting and include views to and from the monuments and the landscape. The impacts on the relationship between archaeological sites has not been addressed by the applicant.

3.2.1.11. Impacts on public roads

There is concern regarding the potential impact that a project of this magnitude could have on a large number of local and regional roads in the County. Impacts will arise from the weight of construction traffic, the damaging effects this will have and the load bearing capacity of the roads to cater for this traffic. There are also concerns regarding the traffic and road safety capacity of the network to cater for the increased traffic during construction and the interaction of construction traffic

with other road users. Clarity is required on who will be responsible for carrying out road repairs following construction.

The applicant has identified 117 temporary access points for the development. A number of these access points are via narrow laneways or field gates which are not capable of providing safe access to the public road or to provide sufficient space for the off-loading of construction materials. Details for the upgrading of these access points to accommodate delivery vehicles and provide safe ingress/egress should be provided.

Details of the estimated traffic per type of tower and the potential increase on each haul route has been provided. It would appear that only one tower will be constructed on a particular haul route. The applicant should clarify that this is the intention and clarify how it is proposed to monitor and enforce this scenario. Details are required on the distance from the edge of the public road to the base of the proposed towers which are adjoining public road, in particular Tower 142 adjacent to the R183.

The developer should be required to lodge a bond of an appropriate amount with Monaghan County Council as surety for the restoration of damage caused to the public road network arising from the development. A condition should also be imposed requiring pre and post construction surveys to be carried out of the public road network that will be used for the construction of the development.

3.2.1.12. Impacts on surface water and groundwater

A project of this scale has potential to contaminate surface water and to a lesser extent ground water. The EIS contains inadequate information in relation to the impact of the proposed development upon surface water and ground water particularly at a site specific level. Additional information is required to assess the cumulative impact of the development.

A site-specific (for each tower or storage area) construction plan detailing the method to ensure the protection of all waters to the site is required. The plan

should include details of existing surface water channels, groundwater and any receptor likely to be affected. Details of silt traps, surface water management tools such as settlement ponds, bunded storage arrangements, pumping (dewatering) criteria and temporary pipework if necessary should be shown. Location of domestic wells should also be detailed. The site-specific plan should detail access and egress arrangement's that could potentially affect surface waters.

There is limited information regarding the phasing of the project. This will have a bearing on the duration of potential impact for each watercourse affected by the construction stage.

3.2.1.13. Waste generation and disposal

The EIS contains inadequate information in relation to the scale of displaced material, the destination of disposal of such material and the impact of the disposal of this material at these locations. Permitted disposal sites relative to each site should be identified to minimise haulage and comply with regulations. The list included in the application is out dated and some are no longer in operation.

3.2.1.14. Noise

It is accepted that the proposals put forward to mitigate noise during construction will mitigate impacts. The applicant should be required to liaise with the local authority prior to development at each site to ensure that the development would have the least possible adverse impact on local residents. Any works outside normal working hours should be agreed with the planning authority.

Unlike construction noise which will be temporary, operation noise may be permanent. The noise sources identified require specific technical assessment, outside the scope of the local authority. A specialist consultant in this field should be employed to carry out a detailed report on the possible impacts of the development on local residents.

3.2.1.15. Air quality

The EIS has outlined proposals that will be put in place to reduce the impact of the development on air quality.

3.2.1.16. Tourism

Failte Ireland has long recognised that the future of Irish tourism is inextricably linked to the quality of the environment. The importance of the landscape and environment in attracting tourists is especially true in Co Monaghan. The recently published policy document 'People, Place and Policy-Growing Tourism to 2025' notes the importance placed on landscape and the quality of our natural scenery and the physical environment as key motivators for visitors. Particular mention is given in the report to the significant infrastructural investments required for future energy needs and the importance of ensuring that there is the right balance between meeting these needs and protecting out tourism assets.

In the absence of flagship tourist attractions, the outdoor activity market is one of the most important market segments for the county. The promotion of Monaghan as a destination for such activities (walking, cycling, angling, forest parks, golf, and equestrian) may be impacted by the proposed development, particularly in terms of visual impact. The OHL will be a visual intrusion on the landscape in a county which has invested in the promotion of its outdoor product.

Existing tourism products which will be directly impacted include angling and walking. The proximity of the line of pylons to some lakes may impact on angling amenity. The most important angling lakes, which include Lough Egish and Lough Morne, may be directly impacted visually by the proposed development. The general amenity value of the Castleblayney Lakelands area may also be detrimentally impacted including Corlatt Lake/Shantonagh and Tonyscallon Lake. The proposed development will have a negative visual impact on the section of the Monaghan Way in the Clontibret area.

The proposed development has the potential to adversely impact on tourism due to the visual impact on the landscape.

3.2.1.17. Impacts upon existing/permitted developments

The proposed development passes in close proximity to a number of farm complexes, dwellings and other businesses which would have the potential to have a detrimental impact upon the extension/addition of buildings to these properties. The EIS has failed to properly consider this impact.

3.2.1.18. Temporary storage compound

While it is stated that the proposed temporary storage compound has been used previously as a storage compound during the construction of the N2, this is incorrect. The lands may have been used to dispose of some excavated material from the line of the bypass.

It is considered that subject to retention of the vegetation on the boundaries of the site and additional landscaping where necessary, the temporary storage compound will be sufficiently integrated into the landscape. Regarding access, no details of visibility splays (or loss of hedgerows to provide these) have been indicated. There are also concerns that the existing vegetation will be lost to facilitate the erection of the fencing and sound barriers. Clarification is required in this respect.

No plans regarding structures on the site such as temporary offices, porto loo and shelving/racks have been submitted. Details of numbers of staff attending and car parking is also required. There may be potential impacts on the amenity of the adjacent dwelling due to its proximity to the compound. A condition should be included with any grant of permission requiring restoration of the site to its original condition following completion of the development.

3.2.1.19. Community gain fund

It is considered reasonable that the developer should make a contribution which will benefit the local community. It is stated in the EIS (Section 5.5.3 Volume 2A) that the applicant will contribute €40,000 per kilometre to a once off fund to be administered with direct input from the relevant local authority and other relevant

bodies or agencies for the benefit of communities in proximity to the proposed OHL.

3.2.1.20. Major incident provisions

The EIS has failed to make reference to any potential impacts or mitigation measures relating to structural failures in either the towers or the conductor lines and the resultant impact upon adjoining properties and sites of bio diversity.

3.2.1.21. Comments by elected members

The final part of the submission highlights the comments made by the elected members of the Council to the proposal:

- Government's inconsistent application of policy regarding undergrounding. Options were given to the public in regard to GridWest and GridLink projects that have not been given to the people of Co. Monaghan.
- No extra electricity will be brought to Co. Monaghan as a result of the proposed interconnector, thus the development should not be imposed on the county.
- Inadequate consideration of undergrounding option
- Inadequate consideration of alternative routes.
- Impact upon human health.
- Inadequate detail in application. EirGrid has not gained access to most of the affected lands.
- Contrary to the provisions of the County Monaghan Development plan.
- Impacts on heritage. Tiled lake at Drumillard, Lough Egish and two mills (Reduff Mill and Harrisons Mill) at Shantonagh will be adversely affected. The statement that there will be no ecological impact on Tassan Lough is incorrect. The importance of area within Monaghan close to the border Drumcarn/Drumnahavil) for Marsh Fritillary butterfly.
- Impacts on bats.
- Impacts on agriculture. The food produced will not have the same status due to overhead power lines. Impacts on future agricultural payments to farmers, farm safety due to proximity of wires.
- Devaluation of property, sterilisation of land etc.

- Socio economic impacts. There would be no economic development in the vicinity of the structures.

3.2.2. Cavan County Council

3.2.2.1. Planning policy context

The proposed development is compliant with national, regional and local planning policies. The objectives of the Cavan County Development Plan 2014-2020 clearly support infrastructure in the county and nationally for strategic economic reasons. It supports the provision of new high voltage electrical infrastructure, including high voltage transformer stations and new overhead power lines. The objectives are clear in terms of the need to conduct feasibility studies to determine where the undergrounding of high voltage powerlines is economically viable and environmentally appropriate.

3.2.2.2. Report of partial undergrounding of the development

Three locations were identified in the EIS for assessment in relation to undergrounding the line to mitigate significant impacts on the landscape. No areas were identified in Co. Cavan where the proposed development would have a significant impact on the environment.

3.2.2.3. Relevant planning history

Planning applications that have arisen in the surrounding area relate to one-off housing, rural and agricultural buildings, school extensions and telecommunications structures (particularly in the Lough an Lea Mountain area). The route is not affected by any approved or current planning applications. No applications (end of March 2015) have been submitted or are awaiting decision within c.200m of the proposed development.

3.2.2.4. Local designations

The proposed development is located c.1.6km from Lough an Lea Mountain located at the edge of Landscape Character Area 5. There is a walking route and

designated scenic viewing points in the vicinity. The line is c.3.9km from the edge of an Area of Special Landscape Interest centred on Kingscourt/Dun a Ri Forest which is considered will not be affected by the proposed development. There are also Lakeside Amenity Areas and Special Heritage Sites, designated in the Plan, which are close to the route as documented in the Constraints Map. Tower 228 and 227 are in close proximity to Muff Cross, where an historical horse fair is held annually.

3.2.2.5. European designations and Natural Heritage Areas

There are no pNHA's or NHA's in the vicinity of the line. There are no SPA's or SAC's in close proximity, the nearest being Lough Sheelin SPA and Mullagh SAC. A Natura Impact Statement has been submitted with the application. Whilst the Cavan County Development Plan defines the buffer area of 5km and 15km from any Natura 2000 site, the NIS identifies a wider study area which includes the River Boyne and Blackwater SAC and SPA and Lough Oughter and Associated Loughs SPA which exists within the geographic area of Co Cavan. The River Boyne and Blackwater SPA was brought forward to Stage 2 Appropriate Assessment due to potential in combination impacts with other development and the possibility of impacts during the construction stage.

3.2.2.6. Protected Structures and Architectural Conservation Areas

The proposal does not directly impact on any recorded structures. There are two recorded structures in the vicinity of the alignment. One is located in the townland of Laragh near Muff in Kingscourt (Our lady of Mount Carmel Church). It is considered to be sufficiently far removed (c.470m) from the development not be negatively impacted. The other structure is located in the townland of Corlea (St. Joseph's Church) and will not be impacted due to distance (c.1.5km).

3.2.2.7. National Monuments

Some Recorded National Monuments are located in close proximity to the line and the views of the Department of Arts, Heritage and the Gaeltacht should be sought in this regard.

3.2.2.8. Flooding

There is no history of flooding in this area of Co. Cavan. There are no major waterbodies in the area, the nearest is Muff Lough which is located c.265m from Tower 226. The planning authority is satisfied that all proposed measures will be put in place to avoid flooding and any impact on surface water quality.

3.2.2.9. Landscape and visual impact

There are a number of local designations that require careful examination in terms of impacts arising from the proposed development. Of particular concern is Lough an Lea mountain which is an area of High Landscape Value, with Scenic Viewing Point and a designated walking route. The visual impact on Lough an Lea is addressed in the EIS. It is concluded that there will be no significant landscape effects on the designated site.

The impact of the development on Muff Lough and in the area around the Muff Fair site will be particularly negatively impacted due to the proximity of the line and towers. There will be significant visual impact on the area in the vicinity of Towers 225-228.

It is noted in the EIS that within the Highlands of East Cavan, there will be changes to landscape character in the vicinity of the line but little alteration to the wider landscape. Cumulative landscape effects will occur where the proposed line crosses the existing 220kV line at Towers 232-235.

It is concluded that this infrastructure project will have a significant impact on the visual amenities of the community and will change the area significantly.

3.2.2.10. Impacts on residential property

EirGrid has sought to achieve a lateral clearance of 50m from the centre of the line to the nearest point of a dwelling. It is considered that Tower 212 as viewed from the R162 is located on elevated land and should be considered for re-siting in order to reduce any potential impact on the visual amenity of dwelling CMSA

R_187. Tower 217 is also located too close to dwelling house and farm buildings CMSAAB_142, CMSAR102 & R199.

3.2.2.11. Road Network

The major impact on the road network will arise during the construction stage. The traffic impact will be on approximately 10 no. roads of 28km in length, including the R162 and R165. The Area/Road Engineers anticipate that there will be additional roads used.

The EIS has adequately dealt with the potential impact of the proposed development on the road network in Co Cavan.

3.2.2.12. Community gain/Development contributions

There are two national schools in the rural area within the vicinity of the alignment, Muff and Corlea. A Special Contribution for Community Gain of € 500,000 should be levied for the purposes of infrastructural or educational projects.

A Special Contribution of €3,016,00 will be required for repair of road network calculated as follows:

- A rate of €18 per m^2 will be required for resurfacing and strengthening the local road network
- 28,000 x 4 (wide) x 18 = €2,016,000.
- For the regional network 15km of road will require surfacing at €10.25 per m^2, requiring a contribution of €1,000,000.

3.2.2.13. Matters raised in other technical reports

Environment Section:

The Environment Section of the report refers to impacts of the development on the landscape between Bailieborough and Kingscourt, concerns regarding the health effects of the development (EMFs) and the collision risk posed by the development to some birds.

Area Managers Report

This report refers to the impact of the development on local roads. It recommends a road pavement survey in advance of construction and a development contribution (€2,016,00 in respect of the local road network and €1,000,000 in respect of the Regional Road network – as above).

3.2.2.14. Conclusion

The planning authority is of the view that the development is acceptable in principle. There are a number of issues not considered adequately or in sufficient detail as highlighted above.

3.2.3. Meath Co Council

The report from Meath Co. Council contains a number of internal technical reports and a report from CAAS (Planning Consultants), which are summarised below for the information of the Board. It also provides details of the planning authority's view in relation to the decision to be made by the Board, the planning authority's view on community gain conditions and it lists 27 no. conditions, which it considers should be imposed by the Board should it be minded to grant approval for the development.

3.2.3.1. Environment Section

With regard to Soils & Geology it is stated that the EIS is unclear as to the extent of site investigation works in respect of soils and geology. With regard to the water environment, it is considered that the towers are likely to have a minimal impact on the flood risk of an area. However, it is noted that some of the towers (No's 284, 287, 288, 309, 310, 314 and 315) are located within 1% AEP floodplains as per the OPW PFRA maps. Confirmation is required as to whether the flood risk was examined on a local level. With regard to discharge water, a condition would be required stating that no water shall be discharged from a silt pond, or, following filtering until a sample has been taken and tested etc.

With regard to paragraph 109, Chapter 8, sampling for suspended solids should be undertaken on a regular basis and if any change in the appearance of a watercourse occurs, sampling shall be undertaken for suspended solids and hydrocarbons.

In terms of climate change the applicant should monitor and record vehicle and construction plant and equipment emissions to air.

3.2.3.2. Road Design Office

The construction of foundations will generate a large volume of HGV movements, which may cause damage to minor county roads. Applicant should provide details of the volume of construction traffic, proposed haulage routes and access locations so that the impact of the development can be assessed. No details are shown of the exact locations of access via public roads except that applicant intends to use existing accesses to lands. The applicant should be conditioned to submit details for entry to ensure that they are safe and do not present a traffic hazard.

3.2.3.3. Conservation officer

The Conservation Officer's notes the length of the route, the wealth of cultural heritage in the county and considers that the avoidance strategy has been reasonably successful. The following structures are listed where it is considered the visual impact on setting will be either moderate or significant.

- Galtrim House and Demesne (NIAH/PS/NIAH garden survey)
- Bective Abbey, (National Monument/PS)
- Bective Bridge Saw Mill (PS/NIAH)
- Bective Bridge (PS, RMP, Protected View from bridge).
- Philpotstown (Dunderry Park) (PS/NIAH Garden Survey).
- Donaghpatrick Bridge (PS)
- Donaghpatrick Church (PS/NIAH).
- Teltown House and Demesne (PS/NIAH Garden Survey)
- Rahood (NIAH Garden Survey)
- Mountainstown House and Demesne (PS/NIAH garden survey)

- Dowdstown (PS/NIAH garden survey)
- Brittas (PS/Register of Historic Monuments, 1997; NIAH Garden Survey)
- Whitewood (PS/NIAH garden survey).

The Conservation Officer raised particular concerns regarding Brittas, Teltown and Bective. In relation to Brittas, it is considered that the applicant be requested to demonstrate the effect of moving the line to the western side of the road. If there is no improvement in impacts applicant should consider other solutions for the line through Brittas, including undergrounding. With regard to Teltown the Conservation Officer considers it may be preferable to underground the line, but that this may have consequences of sub-surface archaeology. In relation to Bective, Photomontage Nos. 64 and 65 demonstrate that the line will be distinctly visible on the horizon when looking west from Bective. Serious consideration should be given to undergrounding the line in this area (would alleviate impacts on the landscape, setting of monuments, Trim airfield, approaches to Trim town, villages of Dunderry and Robinstown, Boyne Valley Driving Route). If not possible then mitigation measures to provide visual screening should be provided e.g. strategic tree planting. The Conservation Officer recommends that monitoring of potential impacts on architectural heritage and demesne lands be carried out by suitably qualified person with expertise in their respective fields.

3.2.3.4. Heritage Officer

The Heritage Officer notes that a large portion of the land take was not subject to ground surveys and that the Board need to satisfy themselves that an appropriate assessment can be undertaken. Provision should be made at planning stage in the event of pre-construction surveys yielding ecological data that may be deemed significant in the context of the impact of the development.

The scale, extent and impact of the proposed development should be considered in a national context and in particular within the development of a National Landscape Character Assessment as proposed in the National Landscape Strategy for Ireland 2015-2025.

A number of towers are located in areas identified as potential wetland sites (Co. Meath Wetlands and Coastal Habitat Survey). In order to fully assess the impact of the development on wetland habitats further information should be sought i.e. the routes, tower locations, access routes, working and stringing areas should be overlain on Meath Wetland GIS mapping and where development is to be located on a wetland or potential wetland, it should be indicated if field surveys have been completed at these locations.

Reference is made to the proposed cutting/trimming of woody vegetation (including mature tree lopping) to provide 6m clearance below line. It is considered that the mitigation measures outlined in Section 6.6.2.1.1 are adequate but that compensatory habitat should be provided at suitable locations.

It is noted that in general it is best practice that cables are laid underground (where possible) or diverted away from flight corridors (Whooper Swan and other birds). Monitoring of effectiveness of flight diverters is not mitigation. Impact on Whooper Swan should be considered both alone and in combination with the potential cumulative impact arising from Emlagh Wind Farm, as both developments intersect key sensitive locations. Recommends further information on the cumulative impact of both developments on local and national Whooper Swan populations.

Reference is made to the two tentative World Heritage Sites at Kells and Tara Complex. It is considered that the development should be considered in the context of the World Heritage Convention, and, cumulative impact in combination with Emlagh Windfarm and Maighne Windfarm, currently under consideration by the Board. It is noted that Photomontage 68 taken from the Hill of Tara (scenic viewpoint 44) is taken under cloudy and overcast conditions (shows an open view of 33 towers). The Board should seek the advice of an independent World Heritage Expert with specific experience in assessing World Heritage Site nominations on behalf of UNESCO to assess if the development would impact (alone or in combination) on any future nomination to UNESCO for World Heritage Status.

The Heritage Officer recommends conditions in respect of timing of construction work; CEMP; employment of an Ecological Clerk of Works; replacement of hedgerows/woodlands; extensive landscaping programme to reduce the visual impact of the development.

Appendix 3 of the report contains an Assessment of Likely Effects on Designated Views conducted by CAAS. It noted that there are 94 no. Protected Views listed in Appendix A12 of Meath County Development Plan. It Identifies designated views within 5km of the proposed line, that may be affected by it (Nos. 13, 15, 16, 17, 18, 19, 44, 86), and designated views outside of the 5km buffer that may also be affected (Nos. 20, 41, 42, 52). It is concluded that the development will have no effect or a low significance for most, but it predicts a moderate or high significant impact on No. 17 (County road between Mullagheven Cross Roads and Gorrys Cross Roads) and No. 86 (Bective Bridge) and a high/very significant impact for No. 44 (Hill of Tara).

3.2.3.5. Planning Authority View in relation to the Decision to be made by the Board

In summary, the report by Meath County Council states that the principle of the proposed development is in line with the broader policy objectives at national, regional and local level.

The proposed development is assessed against the criteria set out in section 11.15.4 of the Meath Co Development Plan Development Management Guidelines and Standards (energy networks). Details are as follows:

- ‘The development is required in order to facilitate the provision or retention of significant economic or social infrastructure’ – This is accepted
- ‘The route proposed has been identified with due consideration for social, environmental and cultural impacts’ – This is also accepted
- ‘The design is such that will achieve least environmental impact consistent with not incurring excessive cost’ – It is accepted that the route is reasonably effective in avoidance, however some further consideration may be required in certain areas as set out above.

- ‘Where impacts are inevitable, mitigation features have been included’ - It is acknowledged that a large proportion of the site has not been subject to ground survey and provision should be made at planning stage in the event that pre-construction survey yield ecological data which may be significant in the context of the impact of the proposed development.
- ‘Where it can be shown the proposed development is consistent with international best practice with regard to materials and technologies; that will ensure a safe, secure, reliable, economic and efficient and high quality network’ -It is considered that the transmission and technology alternatives have been analysed by EirGrid who have concluded that the 400 kV overhead line is the best technical solution for the proposed development and that it would be technically superior and more cost effective than an underground cable. The reference made by EirGrid to the use of short lengths of underground cable is noted.
- ‘Protected and Designated area’s – The report recognises that proposed NHAs, SPAs and cSACs, areas of archaeological potential, landscapes of exceptional or high value, international or national importance and high sensitivity, proximity to structures that are listed for preservation, national monuments etc. have been taken in to account.

The report also raises the following issues, which it requests that the Board has regard to in its decision in respect of the development:

- The level of ground survey in respect of flora and fauna.
- The visual impact of the development on protected structures and demesnes.
- The CAAS report on impact of development on protected views.

3.2.3.6. Planning Authority View of Planning Gain Conditions

The report by Meath County Council notes (a) that when the Board decides to grant planning permission for strategic infrastructure it may attach ‘community gain’ conditions, and (b) the applicant’s proposals for once off community gain fund (page 111, Planning Report). Given the scale of the development, the planning authority considers that it is appropriate that the Board attach a

community gain condition. In addition, Meath County Council refer the Board to the draft Development Contribution Scheme which provides for 'contributions for electricity pylons at €10,000 per 400kV pylon'.

3.2.3.7. Conditions

The report sets out 27 no. conditions in respect of the development. These are generally standard type conditions but include a requirement for an Ecological Clerk of Works for pre-construction, construction and post construction (min 2 years) to advise, oversee and monitor mitigation measures; extensive landscaping/tree planting programme to reduce the visual impact of the development on key assets (to be agreed with Meath County Council) and a suitably qualified cultural heritage consultant with expertise in architectural heritage and demesne landscapes to oversee mitigation measures during construction, in particular where line passes through Brittas, Mountainstown and Philpotstown.

3.3. Observers

In response to the application made, submissions were received from c.900 observers (listed in Appendix 1). These comprise submissions from individuals and families, interest groups and umbrella groups.

Issues raised by observers are summarised in Appendix 1. Of note, issues are raised in respect of:

- The need for the development.
- Legal and procedural matters.
- Public consultation in respect of the application for approval
- Alternatives, in particular the option of an underground route in the public road network.
- Health.
- Impacts on property and land values.
- Impact on agriculture and the equine industry.

- Impacts on tourism and amenity.
- Impacts on flora and fauna, notably Whooper Swan.
- Impacts on soil and water and those arising from noise and vibration.
- Landscape and visual effects, including on demesne landscapes such as Brittas.
- Impact on public roads/traffic.
- Impacts on cultural heritage.

Each of the matters raised by the observers is addressed in the Planning Assessment Section of this report.

3.4. The Response Document

The applicant responded to the observations made in their submission to the Board dated the 19th October 2016.

4.0 THE ORAL HEARING

An oral hearing was held in relation to the proposed development over a period of 11 weeks between 7th March 2016 and 23rd May 2016. The oral hearing schedule is contained in Appendix 2. The documents presented during the course of the hearing are included in Appendix 3. Issues discussed during the oral hearing are considered in the planning assessment below. Reference is made to observers who made substantial submissions and to the individuals representing the applicant.

The Board retained the services of Mr Pierce Regan, Artane Recording Studio, to record the proceedings. This constitutes the official record of the proceedings.

5.0 PLANNING ASSESSMENT

I have examined the file and the planning history, considered national and local policies and guidance and inspected the site.

A second Inspector, Ms Deirdre MacGabhann (Senior Planning Inspector) was appointed by the Board to assist with the application to carry out a review of the submissions made in response to the proposed development and to carry out an assessment of the issues relating to the following topics, which form part of the planning assessment (Section 5 of the report).

- Construction.
- Public consultation.
- Human beings - Population and economic, land use, tourism and amenity.
- Soils, geology and hydrogeology.
- Air and climate.
- Landscape.
- Material Assets.
- Cumulative impacts, impact interactions and transboundary impacts.

I have assessed the proposed development including the various submissions from the applicant, the planning authorities, the prescribed bodies and the third party observers, as well as the reports from the second Inspector. I consider that the key issues that arise for consideration in this case are as follows: -

1. Legal and procedural issues
2. The need for development
3. Alternatives
4. Human Beings
5. Flora & Fauna
6. Soils, Geology and Hydrogeology
7. Water

8. Air and Climate
9. Landscape & Visual Impact
10. Material Assets – General
11. Material Assets – Traffic
12. Cultural Heritage
13. Transboundary Impacts
14. Environmental Impact Assessment
15. Appropriate Assessment

Each section of the report is structured to guide the Board to the relevant section of the EIS relating to the particular topic, the policies and objectives of the development plan, the substantive issues raised in the submissions, applicant's response and the oral hearing proceedings.

5.1. Legal and Procedural Issues

5.1.1. Environmental Impact Statement

The relevant volumes of the EIS are as follows:

- Volume 1A - Statutory Particulars, includes the planning application form, copies of site notice, newspaper notices, etc.
- Volume 1B - Planning Drawings
- Volume 2A – Planning Report /Associated Appendices, contains details of the applicant, legislative context etc.

The proposed development constitutes Strategic Infrastructure (electricity transmission lines) and the application is made under Section 182A of the Planning and Development Act, 2000, as amended.

An EIS is mandatory as the development falls within the scope of Class 20 of Part 1 of Schedule 5 of the Planning and Development Regulations 2001(as amended) involving the *'Construction of an overhead electrical power line with a voltage of 220 kV or more and a length of more than15km'*

The proposed development is not directly connected with or necessary to the management of any European site but has the potential to have significant effects on European sites, which triggers the requirement for Appropriate Assessment. An EIS supports the application.

The proposal is a cross-border project extending into Northern Ireland. Transboundary considerations are considered in the EIS and the overall impacts of the proposal within the two jurisdictions is assessed in a Joint Environmental Report (Volume 4).

The project is designated as a Project of Common Interest in the first Union List created pursuant to the requirements of a new EU regulation for trans-European energy infrastructure (EU No 347/2013).

5.1.2. Issues raised by observers during the course of the application and during the oral hearing

A number of the submissions raise issues regarding legal matters and procedural considerations, which include the following: -

- Validity of the application.
- Nature and extent of the development.
- Designation of the project as Strategic Infrastructure Development.
- Conflict between An Bord Pleanála's role as consent authority and its role as competent authority for Projects of Common Interest (PCI)
- Development will involve project splitting.
- Deficiencies at Strategic Environmental Assessment (SEA) level
- Non-compliance with various Conventions and Directives.
- Inspector's decision to refuse to accept written submissions at the oral hearing.
- Access to lands.

The applicant's response to the issues raised is contained in Chapter 2 and Appendix 1.3 of EirGrid's submission to the Board dated October 19th, 2015.

5.1.3. Oral Hearing

Legal matters and procedures were discussed in Module 1.3 (Legal and Statutory Processes) on March 7th, 8th and March 9th, 2016 (Day 1, 2 & 3 of the hearing).

Submissions were made by the following observers in Part I of the hearing: -

- Mr Esmond Keane, Senior Counsel (NEPPC).
- Mr Michael O'Donnell, Senior Counsel (Braccanby Irish Farms & NY Irish Farms LLC).
- Mr Nigel Hillis (CMAPC).

In attendance for EirGrid were:

- Mr Brian Murray, Senior Counsel.
- Mr Jarlath Fitzsimons, Senior Counsel.
- Mr Des Cox, Senior Planning Consultant.

5.1.4. Assessment

5.1.4.1. Validity of application

The validity of the application is challenged on the following grounds. It is stated that EirGrid cannot legally make the application as it is not in a position to carry out the development and that it does not have sufficient interest in the land or the power to acquire wayleaves. It is argued that EirGrid has failed to comply with Article 22 and 23 of the Regulations. Issues have also been raised regarding the adequacy of the drawings submitted with the application and that additional information was submitted to the Board, which was not made available to the public.

The applicant for the development

The application in this case is made by EirGrid plc with the consent and approval of the Electricity Supply Board (ESB). During the oral hearing there was considerable legal argument surrounding EirGrid's entitlement to make the application on the basis that it would not be carrying out the works on the ground. It was asserted by Mr. E Keane SC (NEPPC) that as EirGrid is not a 'statutory undertaker' as prescribed under section 182A, which is defined as *'the person*

who intends to carry out the development', the Board does not have before it a valid application from a person entitled to apply.

The written submission from Ivor Fitzpatrick & Co Solicitors, considers that there is complete confusion as to who is the proper applicant. It is contended that EirGrid cannot carry out the development, as it has no part to play in the construction of the transmission system arising from the unbundling of functions under the Directive. Should the Board allow the development, it would be contrary to European law, which requires separation of activities of generation and supply under EC Directive 2009/72/EC. The Board is required to consider these directives and cannot be complicit in a process where it seeks to circumvent and avoid compliance with European Community law.

It is also argued that the current application is being made by both EirGrid and the ESB and the failure to identify the ESB as a prospective applicant in the pre-application process renders the application invalid.

Much of the confusion regarding the respective roles of ESB and EirGrid arises from the division of functions originally held by the ESB, on foot of the unbundling provisions required under EU Electricity Directives. Under its provisions each Member State was mandated to establish a transmission system operator (TSO) and to separate electricity production and supply. EirGrid was subsequently established as TSO and the ESB retained ownership of the transmission system. This created a structural split between the ownership and the operation of the transmission system.

The European Communities (Internal Market and Electricity) Regulations, 2000 (S.I No 445/2000) was implemented to give effect to Directive No 96/92 EC. It sets

out the roles and functions of both the TSO (EirGrid) and ESB as transmission system owner.

Under the provisions of Regulation 8, EirGrid as Transmission System Operator enjoys the statutory power:

> *'to operate and ensure the maintenance of and if necessary develop a safe, secure, reliable, economical and efficient electricity transmission system, and to explore and develop opportunities for interconnection of its system with other systems, in all cases with a view to ensuring that all reasonable demands for electricity are met and having due regard to the environment'.*

Separately, Regulation 19 sets out the functions of the ESB as transmission system owner, which is to maintain the transmission system and carry out construction work in accordance with the TSO's development plan. EirGrid therefore enjoys the exclusive function to develop and plan the electricity transmission system, whilst ESB's role is limited to the execution of the plans/projects at the direction of EirGrid.

Regulation 18 of S.I No 445/2000 requires EirGrid and the ESB to enter into an *'infrastructural agreement'* to govern the on-going relationship between the two organisations and to enable EirGrid as transmission system operator to discharge its functions under the Regulations. The Infrastructural Agreement was published in 2006 and has been approved by the CER. The infrastructural agreement expressly provides (Clause 7.6) that

> *'all activities connected with seeking and obtaining planning permission approval and any other consents required by the TSO to discharge its transmission obligations are the sole responsibility of the TSO (EirGrid)'.*

The ESB is obliged under the legislation and the Infrastructural Agreement to facilitate EirGrid's planning intentions in the furtherance of its functions as Transmission System Operator. It is in the discharge of its statutory function that EirGrid proposes this application and accordingly it can be determined to have sufficient legal interest in the application. EirGrid is the sole applicant for planning permission and it has made the application with the consent of ESB as the transmission system owner.

Responding to the argument that EirGrid are precluded from making the application under Section 182A, Mr. Murray SC stated that this would mean that EirGrid as the TSO, with its statutory responsibility is precluded from seeking development consent in respect of its own transmission system. It would mean that the legislation has identified a body with the exclusive function of developing the transmission system and at the same time deprived that body of the power to seek development consent, which would be totally impractical.

I note that similar applications for electricity transmission infrastructure have been brought forward in the same way i.e. by EirGrid as transmission system operator and have been approved by the Board (VA0004, VA0013 and VA0015), with the intention that the development will be constructed by the ESB.

Having regard to the provisions of the EC (Internal Market and Electricity) Regulations, 2000, and the statutory powers conferred on EirGrid under the Regulations, the accepted practice of applications for electricity infrastructure being brought forward by EirGrid and being accepted by the Board, it is my opinion that there is no legal impediment to this application being brought forward by EirGrid.

Legal interest in the lands the subject of the application

It is argued in the submissions that neither EirGrid nor the ESB have sufficient legal interest in the land to make the application and that in the absence of the consent of the landowners neither body can create any interest in the lands.

Mr. Keane SC also referred to the Supreme Court judgement in **Frascati Estates vs. Walker [1975] I.R. 177** and the requirement that a person making an application must have sufficient legal interest or estate in the land to enable him to carry out the proposed development. He argued that whilst consent may be in place for the owners of Woodlands sub-station (ESB) and from the owner of the temporary materials construction yard (Mr Kelly) there is some 103.5 km of development where no consent exists, which EirGrid does not own and has no powers to enter onto the land and construct the development.

Mr. Keane stated that the only persons who are capable of carrying out the development, where the consent of the landowners does not exist, is the ESB. EirGrid, he said is capable of applying under Section 182A in circumstances where it has the consent of the landowner. It was his contention that Section 182A makes perfect sense and allows for a perfectly logical situation where EirGrid had got the consent of the landowner, or had acquired the land. The agreement that exists is a commercial agreement and does not purport to change the legislative provisions.

EirGrid's response document refers to the High Court decision in **E.S.B v Gormley [1985] I.R 129**. The High Court found that the ESB had sufficient interest to support a planning application for the development of power lines over lands they did not own or have an interest in. The interest derives from Section 53(1) of the Electricity Supply Act, 1927, which provides that the ESB may place any electric lines structures above or below ground. The Court held that the ESB had

sufficient interest to support its application, which interest was '*given by statute to enable it to carry out the proposed development on the property in question'*. The ESB therefore fell within the restricted meaning of the word 'applicant' as set out by the Supreme Court in Frascati.

The ESB, as the licensed transmission system owner and as the person with sufficient legal interest in the property, conveys its consent to the making of the application by EirGrid. On the basis of the foregoing, it would appear that there is, therefore, no legal impediment to the making of the application by EirGrid.

Power to acquire wayleaves

It is also contended that neither EirGrid nor the ESB have the powers to access or to compulsorily acquire wayleaves to carry out the development.

Ivor Fitzpatrick & Co Solicitor state that the powers vested in the ESB to compulsorily acquire wayleaves was not transferred to EirGrid and remains with the ESB. Mr Keane on the same topic also noted that the power to acquire a wayleave was not transferred. The power, he noted remains with the ESB even though they have been stripped of any function, power or duty in respect of the operation or management of the electricity transmission system. Mr. Keane referred to Article 3A of the Infrastructural Agreement, noting that it does not allow the Infrastructural Agreement to override or amend the clear statutory provision contained in Section 182A.

In its rebuttal, EirGrid refers to a recent High Court Decision **Electricity Supply Board & EirGrid plc v. Kill Ross Properties Ltd [2014] I.E.H.C 635**. It established that under Regulation 18 of the European Communities (Internal

Market in Electricity) Regulations 2000 the right to survey is shared by both EirGrid and the ESB and both are entitled to enter onto lands for that purpose.

Regarding the power to acquire wayleaves, Mr Keane SC did make reference to Clause 7.6.2 of the Infrastructural Agreement which provides as follows:

> *"The Board, irrevocably for as long as this agreement exists, appoints the TSO as its agent to-*
>
> *(A) exercise all the rights vested in the Board for the compulsory acquisition of land;*
> *(B) make and process all applications for the acquisition of wayleaves and rights of entry on behalf of the Board;*
> *(C) exercise all rights of entry on land vested in the Board pursuant to Regulation 29 of the statutory instrument or any other relevant statutory provisions, insofar as these rights may be required for the development of the transmission system".*

He argued that while the ESB has purported to delegate some of powers to compulsory acquire wayleaves, this could only be exercised where EirGrid was acting on behalf of the ESB. It would not apply where EirGrid were seeking to exercise a function on its own behalf.

Clarity on the matter is provided in a document entitled Additional Information on Operation of Infrastructural Agreement published on CER's website. It acknowledges that the acquisition of wayleaves which were vested in the ESB were not transferred to EirGrid at the time of its establishment. It notes that ESB has pursuant to the Infrastructural Agreement appointed EirGrid as its agent to perform these functions and that the parties have operated efficiently under this structure since 2006. It notes that the omission of these provisions from the list of ESB Transferable Functions is generally accepted to be an anomaly.

I accept that EirGrid has the statutory power to develop the electricity transmission system under its control. This function is vested in the TSO under the provisions of the EC Directive and implementing regulations. It also has exclusive responsibility for seeking planning permission for the development of the transmission system as established by the Regulations. It has been established through the Courts that EirGrid has sufficient interest, established by statute, to make an application for approval on land that is not in its ownership. Its right to enter land for the purposes of survey have been confirmed in the Courts and it would also appear that the power to acquire wayleaves is transferred to EirGrid under the Infrastructural Agreement.

Whilst I accept that the structural divisions required under the unbundling arrangements creates difficulties in terms of understanding the respective roles of the both entities, it would appear that contrary to the arguments made in the submissions and during the oral hearing that there is no impediment to the making of this application by EirGrid. I note that numerous similar applications for approval for transmission system infrastructure have been made to the Board, and whilst similar arguments have been made (VA0015), the Board has raised no significant concerns in this regard.

Non-compliance with Articles 22 and 23 of the Regulations

As noted in the aforementioned submissions, the majority of the land is not in the ownership or control of the applicant and the submission by Ivor Fitzpatrick refers to the mandatory provisions of Article 22(2)(g) of the Planning and Development Regulations 2001. It requires that the written consent of the landowner be provided where the applicant is not the legal owner of the land. Issues have also been raised regarding non-compliance with article 23. This specifies the

requirements for particulars to accompany an application (maps, plans, drawings to appropriate scale etc.).

The application by EirGrid is an application for approval under section 182A of the Planning and Development Act, 2000, as amended, for electricity transmission lines. It is not an application made under section 34 and is not therefore specifically governed by the provisions of article 22 and 23. The provisions of article 22(2)(g) regarding the written consent of the owner of land to make an application applies only to a planning application made under section 34. Similarly, the provisions of article 23 relating to 'plans, drawings and maps' refer back to the provisions of article 22 i.e. to applications made under section 34 of the Act. Accordingly, there is no requirement to comply with articles 22 and 23 of the Regulations. In fact, the distinction is made clear in section 182B (11) where it is stated *that "any development approved under section 182 does not require permission under section 34".*

Whilst Mr. Keane stated that it is correct that the regulations generally only apply to a permission that is made under section 34 or section 37(G), he noted that EirGrid has ignored the General Guidance Note on the Board's application form, which makes it clear that the general provisions of these Regulations apply.

The Board has a standard application form for permission/approval in respect of all types of Strategic Infrastructure Development. The General Guidance Note on Board's application form reads as follows;

> *The range and format of material required to be compiled/submitted with any application in respect of a proposed strategic infrastructure development shall generally accord with the requirements for a planning application as set out in the Planning and Development Regulations, 2001 to 2011 and those Regulations shall be consulted prior to submission of any application.*

The guidance is not prescriptive and there is no specific reference to Articles 22 and 23, but the clear intention exists that the application must be to an acceptable standard. The standard of the drawings has been drawn into question by some of the observers and this is discussed in more detail below.

Additional information

Mr. Nigel Hillis (CMAPC) raised issues regarding what he considered to be additional information submitted to the Board on December 8th, 2015. Mr Murray confirmed that the information submitted arose on foot of a request by the Board dated November 11th, 2015 for ESRI shape files with the red line boundary of the site shown on specific drawings to assist the Board in keeping a record of the application in spatial data format. The information did not introduce any new information but required information already submitted to be provided in a new format.

Planning Drawings

Issues were raised during the oral hearing regarding the adequacy of the planning drawings submitted in support of the application. Mr. E Keane SC made reference in particular to Drawing No PE687-D141-127-008-006[1] of Volume 1B (Volume 4 of 4), showing typical 400 kV tower drawings. It was his argument that the essential elements/principal features of the towers are not shown on the drawings as required by the regulations i.e. conductors, stay or guard wires, insulators, points of connection etc.

[1] Also drawings MT 008-001 to MT 008-004

He noted that there was no information on the drawings as to how the transposition towers will appear physically or how conductors will appear on seven existing towers on the approach to Woodlands sub-station. He stated that there was confusion on the number of conductors that would be in place and no details of the insulators. He made available to the oral hearing copies of the tower drawings submitted in support of the SONI application in Northern Ireland (Submission 2a and 2b) pointing to the contrast in the level of detail.

Mr. O 'Donnell also referred to the absence of detail on the tower drawings. He noted that the regulations require elevations, sections, plans, contours etc. to be shown to an appropriate scale for all development proposals. He noted the requirements of the EIA Directive and the requirement that one describes the proposed development to include accurate and detailed plans and drawings showing each and every structure that is to be constructed. The application fails to provide what is required as mandatory information under the Directive and therefore renders the application incapable of environmental impact assessment.

Reference was made in the written submission to the omission of new dwellings and farm buildings from the planning drawings.

Level of detail of planning drawings

The overhead line elements of the development are described in detail in Section 6.3 of Volume 3B (Common Chapters). Table No's 6.1-6.3 provides details of the tower number, type, height etc., which will be provided along the entire length of the route.

The general arrangement of conductors on the proposed IVI steel lattice tower structures is shown in Figure 6.25, Chapter 6 (Vol. 3B) '*General Arrangement of a C-IVI-I (IVI) Tower'*. In addition, the following drawings provide information on the arrangement of the conductors:

- MT003 series of drawings (Line Route Map with Landholding Boundaries, Planning Drawings, EIS Vol. 1B) indicates a plan view of the outer conductors and central conductor,
- MT005 series of drawings (Plan and Profile EIS Vol. 1B) indicates the arrangement of conductors in elevation (with the outer conductor generally obscuring views of the inner conductor), and
- Figure 5.19 (Vol. 1B) '*Schematic of Transposition Alignment'* shows diagrammatically the re-arrangement of conductors as they pass through the transposition towers.

I note that the arrangement of insulators by tower type is not shown in the planning drawings or in the proposed elevation of towers by type (Figures 6.26 to 6.28, Vol. 3B). However, during the oral hearing it was clarified by Mr Robert Arthur, EirGrid (Day 31) that for intermediate towers, the insulators for the two outer phases lie vertically and the insulators for the centre phase have a 'v-string' arrangement ('suspension structure'). For angle towers the conductors would be horizontal i.e. in line with the conductor ('strained structure'). I note that these arrangements are reflected in respect of intermediate towers in Figure 6.25 (Chapter 6, Vol. 3B) and in the submitted photomontages (Photomontage No's 5, 67, 67A and 73 which show Tower no's. 111, 358 and 388 respectively). The arrangement of the insulators for angle towers 126 and 271 is shown in Photomontage No's 10 and 70.

Responding to Mr. Keane SC regarding the number of conductors that will be in place, Mr Fitzsimons noted that the drawings referred to by Mr. Keane are the MT0005 series (Volume 1B Part 3 and 4) which shows for the most part three wires. He noted that these are side elevation drawings where the development is being viewed in profile and the nearest conductors are obscuring those on the other side.

Whilst I accept that some of the above material can be difficult to understand (e.g. Plan and Profile drawings), I consider that the statutory drawings adequately indicate the arrangement of conductors in plan and profile and that this is supplemented by visual images in Volume 3B of the EIS and in the photomontages of the proposed development. I do not consider, therefore, that the application documents are deficient in this respect.

I accept that it would be preferable for the arrangement of insulators to be shown in the planning drawings. However, the appearance of the proposed insulators is accurately presented in the photomontages of the development. They comprise a relatively minor aspect of the proposed development and would not of themselves significantly impact on third parties (by way of their visual impact). I consider, therefore, that the information provided in the application documentation, as clarified at the oral hearing, is adequate and sufficient for the Board to make an informed decision on the application.

In response to the observers' submissions that a number of houses and a large poultry laying unit were not identified on the planning drawings, it is acknowledged by EirGrid that the new laying unit on lands owned by Philip and Ana Collins (Land Parcel LCT 011-012 -013) was not shown on the drawings but was visually assessed (being visible from the roadside) and was considered in the land use impact appraisal.

5.1.4.2. Nature and extent of the development

Mr Keane SC queried the extent of development that would take place within the red line shown on the planning drawings. It was his contention that the insulators carrying the outer conductors would extend beyond the 19m width delineated on the drawings. He also contended that the access routes should form part of the planning application.

Development within the red line

There was considerable debate during the oral hearing regarding the extent of development included within the red line shown on the planning drawings. Both Mr. Des Cox (EirGrid) and Mr. Murray SC (EirGrid) confirmed that all works associated with the development will be contained within the red line. There would be no 'works' as defined by the Acts outside this boundary. The area is defined by the outer conductors and is 19m x 19m wide in the case of intermediate towers, and c. 24m x 24m in the case of angle towers.

I would point out to the Board that a distinction was made during the oral hearing between the 'works area' which is the area included within the red line, and the 'working area' which is the 30m x 30 m construction area. It is my understanding that all excavation/construction etc., will take place within the 'works area' and the 'working area' will be used for associated or ancillary activities, which do not require planning permission in their own right.

It was confirmed during the oral hearing that the working area will be fenced off during construction using temporary 'Heras' fencing. It was argued by Mr Keane that EirGrid are incorrect in stating that the provision of this fencing does not constitute 'works' on the basis that no excavation or construction would be required. He referred to Section 3 and to the definition of 'development' as 'the carrying out of any works, on, in or under land'. He questioned how EirGrid ignores the 'on land' part of the definition of 'development'.

The fencing will sit in concrete blocks (Submission No 26) on the ground surface. It will be free standing and will be in place during the construction period and removed thereafter. I consider that the provision of the fencing as proposed would fall within the provisions of Class 16 of Part 1 of Schedule 2 of the Planning and

Development Regulations, 2001, as amended. Class 16 provides that certain structures, works etc., required temporarily in connection with a development that benefits from planning permission, are exempted development, provided they are removed following completion of the development: -

> *"The erection, construction or placing on land on, in or under which, or on land adjoining which, development consisting of works (other than mining) is being or is about to be carried out pursuant to a permission under the Act, or as exempted development, of structures, works, plant or machinery needed temporarily in connection with that development during the period in which it is being carried out."*

Insulators

Mr. Keane also noted from the Northern Ireland drawings of the towers and that the insulators carrying the outer conductors would be suspended off the outer extremity of the outer arm. If the same was to occur in the south this would mean that the insulators would extend beyond the 19 m width delineated on the application drawings.

It was Mr. Cox's (EirGrid) understanding that the insulators would be contained within the 19m wide corridor. It would appear from Fig 6.25 showing the general arrangement of the tower infrastructure that the insulators do project marginally beyond the outer arms of the towers. Having regard to the limited overall size of the insulators relative to the nature and scale of the individual towers and the overall development, I do not consider that such a minor discrepancy is material to the consideration of the application, or of such significance to warrant an invalidation of the application.

Access routes

The applicant proposes using existing access routes to agricultural land to access tower sites, stringing locations and guarding areas. Mr. Keane queried why these temporary access routes did not form part of the planning application.

In the Board's pre-application meeting with the applicant, the Board advised the then prospective applicant that '*the planning application drawings should indicate access to tower locations for construction and servicing purposes at the point of the public road' (Record of Meeting, December 2013).*

I would also note that the Board advised the applicant (minutes of the Board's pre-application meeting with the applicant held on the 23rd December 2013) in respect of the access to construction towers that the drawings '*could be similar to those submitted in the application for the Laois-Kilkenny Reinforcement* Project' (VA0015). Statutory drawings for this project did not identify temporary access routes to tower sites.

It was confirmed by the applicant on numerous occasions during the oral hearing that the access roads do not form part of the planning application, but are presented in an indicative manner in order to allow environmental impact assessment of the development. In this context, it would not appear inappropriate that the access routes are omitted from the statutory drawings. The Board can only adjudicate on the application as so presented and should it transpire at some future date that works, constituting development, are required to facilitate access, then EirGrid will be constrained by the provisions of the planning acts. There is no substantial evidence before the Board at this time that any such works are likely to be required.

Access routes in sensitive locations

Mr. Keane SC also raised issues regarding 'works' including the laying down of matting to form a road which he argued constituted development under section 3 of the Planning and Development Act. He also noted the provisions of section 4(1)(ia) which states:

(ia) development (other than where the development consists of provision of access to a public road) consisting of the construction, maintenance or improvement of a road (other than a public road) or works ancillary to such road development, where the road serves forestry and woodland.

He stated that the type of access routes proposed by the applicant do not qualify for an exemption under this section. He also brought the attention of the Board to the provisions of Section 4(4) which de-exempts development where an environmental impact assessment of the development is required.

It was confirmed by EirGrid that the temporary access roads will not involve 'works' as defined under Section 2 of the Act. There will be no construction and no excavation. There are no proposals to develop stone roads and no timber sleepers will be installed. In the vast majority of cases, access will be along existing tracks and where this is not possible, mats will be placed on the ground surface to facilitate construction machinery.

I would again draw the attention of the Board to Class 16 of the Regulation referred to above. It would appear that the placing of the temporary matting on the access routes, being land adjoining land where development is to take place pursuant to a permission, is exempt under the provisions of the Regulations. With regard to the removal of exemption under section (4)(4), where an EIS is required, I note the development (works to temporary access roads) is not

development of a class set out in Part 1 and 2 of Schedule 5 of the Planning and Development Regulations 2001, as amended, requiring EIA in its own right, and accordingly the matter of EIA does not apply.

5.1.4.3. Determination of the project as Strategic Infrastructure

The submission by Ivor Fitzpatrick & Co Solicitors suggests that there was an application submitted to the Board to *designate* the project as strategic infrastructure development and that the public were excluded from that process. It states that the Board is obliged to consider the planning and economic benefits of the development and requires judgements to be made regarding its strategic importance to the region and the State. It is contended that if the Board was aware through submissions of the degree of impact of the development on the public's property, environment and their community, it is unlikely that it would have concluded that it is Strategic Infrastructure.

It is also argued that there is conflict in the role exercised by the Board in this process and in its determination of the application on the basis that it is bound by the matters already decided.

The proposed development constitutes strategic infrastructure development pursuant to section 182A of the Planning and Development Act, 2000, as amended. This section specifically relates to electricity transmission lines which includes a high voltage line with a voltage of 110 kV or more, or an interconnector. There are no tests to be applied, as in the case of development referred to in the Seventh Schedule. The proposed development comprising an electricity line with a voltage of 400kV, is by definition strategic infrastructure development.

Section 182E of the Act sets out certain procedures to be followed in advance of seeking approval from the Board. This includes a requirement for the applicant to enter into consultations with the Board in relation to the proposed development. This is a two-way process where the Board may advise the prospective applicant on what considerations relating to proper planning and sustainable development, may, in its opinion, have a bearing on its decision, and, the prospective applicant

may request the Board to give an opinion in writing on the information to be contained in an EIS.

The rationale behind the process is to improve the quality of what are generally large and complex applications and to enable a decision to be made within the statutory timeframe. It is made clear under Section 182E (5) that such consultation is for advice purposes only and cannot be relied on in the formal planning process or in legal proceedings.

It is also stated by Ivor Fitzpatrick & Co Solicitors that the Board engaged privately with EirGrid and the public was excluded. Under the provisions of Section 182E (5), there is no provision for public involvement. However, the Board is obliged to maintain a record of consultations and these are made public following the closure of the process. The record of pre-planning consultations between EirGrid and An Bord Pleanála is on the public record (VA.0054).

5.1.4.4. Conflict between An Bord Pleanála role as consent authority and its role as competent authority for Projects of Common Interest (PCI)

The North-South interconnection development is strategic infrastructure development (SID) and also a PCI project. The Board has two roles, one as statutory consent authority for SID and the other as the designated competent authority for PCI in the State. As a result of the process, the Board will issue two separate decisions in this case, a normal planning decision and a comprehensive decision. Its role as Competent Authority in the permit granting process for PCI's is to collate and co-ordinate the issuing of all the consents and decisions required from all relevant authorities and to monitor compliance with time limits by the concerned authorities.

Concerns have been raised in the submissions that this dual role compromises the Board's independence and that it cannot remain impartial.

During the oral hearing Mr Hillis (CMAP) expressed his concern that the Board had been identified as a promotor or facilitator of the project. He noted *EirGrid's 'All Island Generation Capacity Statement 2016-2025,* which states at Page 7 that '*in association with the competent authorities in their respective jurisdictions we are actively progressing work to deliver this project of common interest by 2019'*. He stated that if An Bord Pleanála is working in association with EirGrid to deliver the project then it cannot act in accordance with the principle of natural justice as they proclaim in their mission statement.

Mr. Esmond Keane SC noted that in designating the Board as the competent authority for Projects of Common Interest (PCI), the State had relied on Article 8.3(c) of the regulation, which allows for the appointment in accordance with the collaborative scheme. As far as he was aware there are no other authorities involved to co-ordinate the consent giving process in this case which he said leaves the Board in an impossible position with a complete conflict of interest in relation to this matter.

Clarity on the dual role exercised by An Bord Pleanála is addressed in *the Projects of Common Interest Manual of Permit Granting Processes,* published by the Board under Article 9 of the Regulations. It acknowledges that the Board is a consent authority in its own right and feeds into the PCI process as do other authorities concerned. Its function, as competent authority, is to co-ordinate all the decisions and make sure that timescales are adhered to. It does not carry out any merit based assessment in terms of planning decisions.

To ensure its duties under PCI will not affect its role as a consent granting body and the impartial assessment of planning applications, the Board has established a separate administrative unit to maintain the division of function. It is staffed by administrative staff with no direct involvement from planning staff. The new PCI

Unit will remain separate from the other planning functions of the Board including the SID Unit and neither role will impinge on the other.

This is clearly set out as follows in the Manual;

> *'An Bord Pleanála's role under the Collaborative Scheme is such that An Bord Pleanála as a consent granting body in its own right feeds into the PCI process as do the other authorities concerned. With a PCI project which is also a Strategic Infrastructure project, it may assist in thinking of An Bord Pleanála as having two roles: one role as a decision making body in the planning sphere and another role as Competent Authority in the PCI process. Neither role will impinge on the other and the separate administrative unit will maintain the division of function'*

In designating An Bord Pleanála as competent authority, the State accepted that it could before perform both roles without any disabling conflict of interest. Its statutory planning role in determining any application lodged with it continues to be one of independent assessor.

5.1.4.5. Development will involve project splitting

The proposed interconnector is a cross-border project with part of the development located in the UK and Northern Ireland. It is contended in the submission by Ivor Fitzpatrick that it is a single project, which should be assessed as a single integrated project. It is stated that the Board and its counterpart in Northern Ireland must integrate its decision making process to provide for a single decision making procedure. It is contended that it is not possible to adequately assess the proposal and comply with the requirements of European community law by having two separate assessments.

The term 'project splitting' is normally associated with the division of a large project within the same jurisdiction into a number of constituent parts to avoid the

necessity for EIA. The proposed development is transboundary, located in two different jurisdictions with the potential to cause significant environmental effects in each. The European Commission recognises the difficulty associated with assessing the environmental impact of such projects as the countries authorising the projects may have different legal systems and EIA procedures. It has published guidance to ensure that the environmental information covers and assesses the project as a whole and avoids splitting up long distant projects.

The guidance[2] states that each developer should prepare individual national EIA reports and a joint environmental report that covers the whole project and assesses its overall effect, in particular cumulative and significant adverse transboundary effects. The aim is to ensure a holistic assessment of the projects effects and to avoid splitting the project. EirGrid has complied with the guidance and prepared a Joint Environmental Report which is contained in Volume 4. This ensures that the proposed development is assessed as a whole and is discussed in more detail under Transboundary Impacts.

Mr Val Martin (observer) raised issues regarding project splitting on the basis that the proposed development would facilitate future development of wind energy, which should itself be subject to EIA. Whilst the proposed development may facilitate greater integration of renewables, it is brought forward as a stand along project, with no facility to tap into the transmission system between the sub-stations at Woodland in Co. Meath and Turleenan in Co. Tyrone, and does not set out in any manner a framework for the future development consent of other projects.

[2] Guidance in the Application of the Environmental Impact Procedure for Large Scale Transboundary Projects (EU, 2013)

5.1.4.6. Deficiencies at Strategic Environmental Assessment (SEA) level

It is contended in the submissions that the statutory process is flawed due to the failure to carry out SEA level on the application and various plans and programmes which set out the framework for the project. Reference is made in the submissions to the Renewable Energy Directive (2009/28/EC), the National Renewable Energy Action Plan (NREAP) and Grid 25. During the oral hearing Mr N Hillis also referred to the Regional Integrated Development Plan (RIDP).

Mr M O'Donnell also raised the matter of SEA in his submission to the oral hearing. He noted that whilst EirGrid indicate that this is not a development that requires strategic environmental assessment, this is an issue that is to be the subject matter of the preliminary hearing in N. Ireland. He questioned what would occur if the northern authority decide that a strategic environmental assessment is required, where would that leave EirGrid's application.

The requirement for SEA derives from the SEA Directive (2001/42/EC) which came into force in 2001. Under its requirements competent authorities must subject specific plans and programmes to an environmental assessment where they are likely to have a significant effect on the environment. SEA is confined to *plans and programmes* as set out in Article 2 of the Directive.

Article 2 defines plans and programmes as follows:

> *'Plans and programmes which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government, and which are required by legislative, regulatory or administrative provisions.*

SEA does not apply to individual projects and as noted by Mr Fitzsimons during the oral hearing this was clarified by a decision in **Kavanagh-v-Ireland 2007 IEHC 296** in which the High Court had to determine whether the National Development

Plan and also certain decisions of the Government to develop a prison at Thornton Hall was a plan or programme to which the SEA Directive applied. In his judgment Mr Justice Smith distinguished between a plan on the one hand and a stand along project on the other and considered that a plan or programme set the framework for future development against which individual consents for particular projects are made. He concluded that there was no information that the development of a prison site at Thornton Hall amounted to a plan.

Mr Fitzsimons refuted any suggestion that the there is any deficiency in relation to compliance with the SEA Directive. He noted that the proposed development forms part of EirGrid's Grid 25 development strategy, which was subject to SEA. Both Grid 25 and the related SEA expressly refer to the North-South Interconnection Development. Thus, an SEA of the plan/programme which incorporates the project has been carried out.

The current proposal is a project as distinct from a plan or programme. It is subject to the provisions of the EIA Directive and not the SEA Directive. Any lack of SEA for plans/programmes at national or European level is outside the remit of the Board, and must be addressed through a different forum. I note that the Preliminary Enquiry in respect of the SONI proposal in N. Ireland referred to by Mr O Donnell was held and the question of SEA was raised. I am not aware of any decision in this regard. However, it would be difficult to envisage how the proposal which involves an electricity line could be viewed as a plan or programme with a requirement for SEA.

5.1.4.7. Non-compliance with EU Conventions

Issues have been raised in the submissions regarding non-compliance with the Espoo and Aarhus Conventions and with the EIA and Habitat's Directives.

The Espoo Convention set the rules for carrying out environmental impact in a transboundary context. It sets out the obligation to assess the environmental impact of certain activities at an early stage of planning. It also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse impacts on the environment across boundaries. This matter has already been addressed at section 6.2.4.5 above. I accept that EirGrid /SONI have complied with this requirement and the JER is submitted to both the planning authorities in Ireland and N. Ireland for consideration.

One of the basic rules of the Aarhus Convention is to promote the involvement of the public in environmental matters. It makes provision for three basic rights to be exercised by the public e.g. access to environmental information, the right to participate in decision making and access to justice. It requires that the public be given early (i.e. when all the options are open) and effective opportunities to participate in environmental decision making procedures.

Whilst the public consultation process conducted by EirGrid is documented in greater detail in a later section of this report, I would point out to the Board that following the withdrawal of the previous application in 2009, EirGrid carried out a detailed re-evaluation of the entire project. The process took place in two stages, each resulting in the publication of a report which was subject to public consultation. The process which was conducted between 2010-2013 afforded the public the opportunity to become actively engaged in the process from an early stage and prior to the publication of the preferred project solution and the final proposal.

Issues regarding non-compliance with the EIA and Habitats Directives are discussed under the heading of Environmental Impact Assessment and Appropriate Assessment at a later stage in this report.

5.1.4.8. Inspectors' decision not to accept written submissions

Mr. Keane SC questioned the Inspector's decision not to accept written submissions during the oral hearing. Arguing that there was no provision for this under section 135 of the Planning and Development Act 2000, as amended. He queried whether it had arisen on foot of a direction from the Board. He noted the established team of experts available to EirGrid and his concerns that members of the public may have difficulty in collating their thoughts during the hearing. He noted the requirement for public participation and that people should be given a meaningful arena in which to make their submissions and observations in whatever way they felt most comfortable. Mr. Keane also felt that he should also be in a position to hand in to the hearing the statement of grounds for judicial review.

Mr. Keane was informed that the decision not to accept written submissions during the oral hearing was made by the presiding inspector. His attention was drawn to the provisions of section 135(2) of the Planning and Development Act, 2000, as amended which provides that *'the person conducting the oral hearing of an appeal, a reference or an application, shall have discretion as to the conduct of the hearing'.* He was informed that the decision was made having regard to the significant number and the content of the submissions received by the Board prior to the hearing, the need to avoid undue repetition and the need to conduct the hearing as expeditiously as possible, as required under the legislation. It was also an important element in the detailed scheduling of the hearing that was carried out and which was considered would facilitate and enhance public participation.

I would point out the Board that each individual/group who expressed an interest in making a submission was facilitated during the course of the hearing. The option was available to any party to prepare a written submission and read its content into the record. I do not accept that any of the parties were prejudiced in any way by this decision, or that there was any infringement of their right to participate in the process.

5.1.4.9. Access to Lands

Many of the observers contend that the EIS is flawed and that the lack of access to land has implications for proper assessment of environmental matters. They argue that the reliance on desk top studies undermines the confidence in the planning process.

The EIA Directive (Annex 4) makes provision for the inclusion in an EIS of an indication of any difficulties encountered by a developer in compiling the information required for an EIS. The lack of access to lands along the proposed alignment was identified as a difficulty in the EIS (Section 1.5.5 of Volume 3B). Whilst access was sought by EirGrid, the vast majority of landowners refused. Approximately 25% of the lands were surveyed by EirGrid. The question that arises is whether the other methodologies used by the applicant to appraise the environment are sufficient to enable the Board, as competent authority to carry out assessments for the purposes of both the EIA and the Habitats Directives.

Before addressing the substantive issue, I would like to point out to the Board that EirGrid was asked by the Inspector to clarify, if it had the statutory power to enter and survey land, why it had chosen not to use these powers. Responding (Day 16), Mr Fitzsimons SC stated that the ESB had long standing powers of access to lands for the purposes of exercising its statutory powers, pursuant to Section 20(4) of the Electricity Supply Act 1927. It was EirGrid's view that those powers were transferred to EirGrid under its functions as Transmission System Operator, pursuant to the EU Internal Electricity Market Regulations 2000. This view that these powers of environmental surveying were transferred to it was confirmed by

the High Court decision in Electricity Supply Board & EirGrid plc v. Killross Properties Ltd [2014] I.E.H.C 635. However, Mr Fitzsimons stated that EirGrid respects the rights of each landowner and always seeks to achieve access by liaison. He noted the methodology used by EirGrid to gather site information, which was considered and proven to be robust. Accordingly, it was that their view that there was no necessity to take the unprecedented step of issuing hundreds of survey notices.

Adequacy of information contained in the EIS to carry out EIA and AA

In the absence of access to the majority of lands adjacent to the alignment, one of the issues repeatedly raised by the observers related to the adequacy of the information contained in the EIS and the NIS and the ability of the Board to carry out assessments under the EIA and Habitats Directive.

Mr Fitzsimons addressed this matter during the oral hearing (Day 16). He referred to the extensive suite of alternative assessment methods utilised by EirGrid and its consultants to successfully compile the information necessary for environmental assessment. He stated that EirGrid remains of the opinion that the appraisal methods used in compiling the information more than adequately complies with the requirements of EU and Irish legislation.

The majority of the route is situated on lands classified as improved agricultural grassland i.e. with a uniform land cover. It has been selected to avoid sensitive receptors and to ensure that the siting of the towers etc. minimises potential impacts. The appraisal of the existing environment was not limited to desk top studies as contended by the observers. I would point out to the Board that EirGrid were granted access to c. 25% of the lands and were in a position to conduct visual assessment of another c. 38%, resulting in an assessment of c. 63% in total of the lands along the alignment. The appraisal was assisted by the use of LiDAR (recognised to have a high degree of accuracy), high resolution aerial photography, the use of third party published data sets/on line mapping, vantage point surveys, extended ecological surveys etc., allowing a comprehensive and detailed evaluation of existing environmental conditions to be established.

Whilst many of the observers query the efficacy of such measures, and I accept that it was not possible, for example, to obtain the level of detail required to identify specific species types in woodland in the Brittas estate, EirGrid were able to demonstrate the accuracy of the information provided during the various modules of the oral hearing. The Board will note from the various sections of this report the level of detail obtained and presented on the existing environment. I draw the attention of the Board, for example, to the identification of the farming enterprise types along the alignment which showed a very low margin of error (Land Use section of the report) and to the presentation by Dr Crushell (Submission No 20) showing the level of detail provided with regard to habitat mapping. It was also confirmed during the oral hearing that the findings of the desk top studies were confirmed in every case by the subsequent field surveys, where access was made available. As noted by Mr Fitzsimons, the Directive does not prescribe any particular method of information gathering for the purposes of the assessment (Day 16).

Having reviewed the EIS, NIS and all the supporting documentation to the application, the observers' submissions, applicant's response and having considered the matters raised at the oral hearing, I am satisfied that the information is sufficiently detailed and comprehensive to allow the Board to carry out a robust and accurate assessment of the development for the purposes of both the EIA and the Habitats Directive.

5.1.5. Conclusion

It is my view that EirGrid has established that it has sufficient legal interest to make the application and the statutory power to implement the development. Any question of invalidity on this basis is therefore without merit.

The proposed development constitutes Strategic Infrastructure pursuant to section 182A of the Planning and Development Act 2000, as amended, and there is no

requirement to satisfy other criteria as in the case of Seventh Schedule development.

I accept that there is adequate information on the application file including extensive photomontages which readily demonstrate to the public the visual appearance of the development. Furthermore, having regard to the ubiquitous nature of these structures, I do not consider that the absence of some of the elements on the drawings (such as the insulators, conductors etc.), which are shown in other sections of the EIS, prejudices the Board in making an informed decision on the application.

EirGrid has excluded the temporary access routes from the statutory drawings accompanying the application for approval on the basis that they will be progressed under their statutory powers. This approach is consistent with that taken for other electricity transmission projects in the State and has been accepted by the Board. This approach is, therefore, considered to be acceptable. The temporary access routes are included for purposes of environmental impact assessment and this approach is also considered to be acceptable.

Whilst I accept that it would have been beneficial if the tower drawings contained a greater level of detail, similar to that included on the SONI drawings, the main dimensions (height, width) of the towers are clearly shown

It has been demonstrated that notwithstanding its roles as competent authority under the PCI process and consent authority for strategic infrastructure development, through the processes it has put in place, the Board maintains the level of independence and objectivity required to consider and determine the application, while at the same time fulfilling its functions under the PCI process.

Notwithstanding the cross border nature of the application which traverses two jurisdictions with different legal processes and EIA procedures, the applicant has not tried to circumvent the need for EIA or engaged in project splitting as alleged by the observers. EirGrid has had regard to the guidance provided on EIA in a transboundary context and has provided an integrated assessment of the project on both sides of the border.

5.2. Need for the Development

5.2.1. Environmental Impact Statement

The strategic need for the proposed development is addressed in Chapter 2 of Volume 3B (Common Chapters) of the EIS and in a report produced jointly by EirGrid and SONI (May 2015) included in Appendix 2.1[3] Volume 3B (Appendices). The European, national, regional and local policy context for the proposed development is described in Chapter 4 of Volume 2A, and has already been summarised in the Policy section of this report.

5.2.2. Issues raised by observers during the course of the application and during the oral hearing.

The main issues raised may be summarised as follows: -

- The need for the interconnector development has not been adequately demonstrated.
- Re-enforcement of the existing interconnector would produce the same results.
- The development is required to supply power to Northern Ireland, the UK and Europe and is of no benefit to people in the south or local communities.
- The project should have been subjected to the same government review process as other EirGrid projects.
- The need for the project independently of the previous application must be demonstrated.
- The input of wind energy as a rationale for the development is overstated.
- A cost-benefit analysis of the proposed development was not undertaken.

The applicant's response to the issues raised is contained in Chapter 3 of EirGrid's submission of October 19th, 2015 to the Board.

[3] The Need for a Second North-South Interconnector (EirGrid/SONI) 2015

5.2.3. Oral Hearing

The need for the development was discussed in Module 1.5 on March 14th, 2016 (Day 4 of the hearing).

Submissions were made by the following Observers: -

- Mr Kevin Brady - Principal Officer, Strategic Energy Policy (Department of Communications, Energy and Natural Resources).
- Mr Garrett Blaney - Chairperson, Commission for Energy Regulation.
- Mr Owen Wilson - Chief Executive, Electricity Association of Ireland.
- Mr Neil Walker - Head of Infrastructure Unit, IBEC.
- Mr Iain Hoy - Senior Policy Advisor, Confederation of British Industry N. Ireland (CBI NI).
- Mr Mark O' Mahony - Director of Policy and Communications, Chambers Ireland.
- Mr Nigel Hillis - Co Monaghan Anti-Pylon Committee (CMAPC).
- Dr Colin Andrews - North East Pylon Pressure Campaign (NEPPC).

In attendance for EirGrid were:

- Mr Mark Norton, Manager, Network Planning, EirGrid
- Mr Philip O'Donnell, Manager, Energy System Analysis, EirGrid
- Mr Brian Murray, Senior Counsel.

5.2.4. Assessment

5.2.4.1. <u>The need for the interconnector development has not been adequately demonstrated</u>

The need for the development is questioned in many of the written submissions to the Board. The submissions to the oral hearing by Mr N Hillis (CMAPC) and Dr C Andrew (NEPPC) challenged the need for the development at a strategic and technical level. It is their contention that EirGrid have failed to conclusively demonstrate the real need for the North-South Interconnector.

The strategic need for the development is identified at EU level and at national level. As already noted in the policy section of this report, various policy frameworks and energy directives have been introduced over the last number of years to address emerging energy and climate change challenges. The directives seek to address measures regarding security of electricity supply and infrastructure investment, the promotion of energy from renewable sources and the introduction of common rules for the generation, transmission, distribution and the supply of electricity. The policy frameworks identify the need for a fully integrated electricity market within the EU to achieve its core energy policy objectives of competiveness, sustainability and security of supply. It is recognised that in order to achieve these goals, energy infrastructure needs to be expanded, modernised and interconnected across borders. The lack of interconnection is identified as a significant impediment to the achievement of European electricity market integration and is considered vital for countries such as Ireland.

In order to support the development of an integrated EU energy market the EU Commission has drawn up a list of key infrastructural projects, Projects of Common Interest (PCI's), which are considered essential for the completion of Europe's internal energy market. These are projects that are considered would contribute the most to the implementation of strategic energy infrastructure priority corridors and areas. Under Regulation EU 347/2013, a total of 12 strategic trans-European energy infrastructural priorities were identified, the implementation of which by 2020 is considered essential for the achievement of the EU's energy and climate policy objectives (Annex 1 of Regulation).

The proposed development is designated a Project of Common Interest (PCI) established under the first Union list of PCI's adopted by the EC on the 14th October 2013 and is described as follows;

> *'2.13.1 Ireland-United Kingdom interconnection between Woodland (IE) and Turleenan (UK-Northern Ireland). A new 400kV AC single circuit (OHL) of 140km and with a capacity of 1,500 MVA between Turleenan 400/275kV in Northern Ireland (UK) to Woodland 400/220kV (IE) (onshore).'*

The provisions of Article 7(1) of Regulation 347/2103 and the adoption of the Union list establishes for the purposes of the permit granting process, the necessity of these projects from an energy policy perspective. The designation of the proposed north-south interconnector as a PCI means that it should be given 'priority status' at national level and considered by competent authorities as being in the 'public interest'. Its designation facilitates the development of one of the energy infrastructure priority corridors identified in the Regulations and facilitates the integration of the energy market in line with European policy.

At a national level, the Government's most recent energy policy update *'Ireland's Transition to a Low Carbon Energy Future 2015-2030'* (DCENR 2015) sets out a vision and framework to guide Irish energy policy to 2030. It takes account of European and international climate change objectives and agreements, as well as Ireland's cross Governmental social, economic and employment priorities. It recognises that a radical transformation of Ireland's fossil fuel based energy sector to a low carbon system by 2050 is required to meet climate change policies and reduce greenhouse gas emissions. One of the key needs identified is the need for appropriate energy infrastructure including energy networks and interconnection.

The strategic need for the development is driven by a number of key Government objectives (documented in the Policy section of this report) in the field of energy and the environment and in particular the maintenance of the single market for electricity on the whole island of Ireland. The Single Electricity Market (SEM) has been in operation since 2007 and it facilitates the transfer of power on an all-island basis. The overarching operating principle of the single electricity market is that the demand for electricity should be met in the cheapest way possible. However, this cannot currently be realised, as the existing interconnector does not have sufficient capacity to carry adequate power to allow the cheapest produced electricity to flow freely between where it is generated and where it is consumed.

The limited interconnection between the island's two electricity systems means that they cannot operate as a single system and this results in inefficiencies and increased electricity costs. The lack of interconnection limits both the flow of energy on an all-island basis and the establishment of a single EU wide wholesale

electricity market in accordance with EU policy objectives. In order to ensure the SEM operates more efficiently further interconnection between Ireland and Northern Ireland is necessary.

The proposed interconnector is therefore a critical and strategically important element of electricity infrastructure to secure the optimisation of the Single Electricity Market at national level and a fully integrated market across Europe

The strategic importance of the proposed development to both jurisdictions was highlighted during various submissions to the oral hearing and these are summarised below for the information of the Board.

Mr Kevin Brady, representing the Department of Communications, Energy and Natural Resources (DCENR) confirmed that the North-South interconnector is a key project in delivering the objectives of national energy policy. It is specifically supported by Government policy, most notably in the recently published White Paper entitled *'Ireland's Transition to a Low Carbon Energy Future 2015-2030'*. He noted that one of the key needs identified by the energy White Paper and EU energy policy is the need for appropriate energy infrastructure including energy networks and interconnection with other countries energy systems.

Mr Brady stated that the White Paper reiterates the government's commitment to the all island single electricity market. In order to support the operation of a single electricity market and its future development, the electricity transmission system across the island of Ireland must operate efficiently. He noted that a key barrier to the efficient operation of the market has been the limited interconnection between Ireland and Northern Ireland. He stated that the development of the North-South Interconnector in conjunction with the single electricity market will lead to benefits to energy consumers across the island of Ireland through reduced costs resulting from more efficient operation of the system. He concluded that the North-South Interconnector project supports the core objectives of European and national energy policy, namely sustainability, security of supply and competitiveness

Mr Garrett Blaney spoke on behalf of the Commission for Energy Regulation (CER). He also stressed the need for the development in the interests of the consumer of both Ireland and Northern Ireland in terms of security of supply and market efficiency. Whilst security of supply is currently more urgent in Northern Ireland, EirGrid have predicted significant growth in Ireland over the next ten years, driven by expected economic recovery, electrification of heat and transport as a result of decarbonisation, and increased demand for data centres which are high electricity consumers. He stated that insufficient North-South interconnection would increase the risk of security of supply challenges to Ireland from 2023 onwards.

In terms of market efficiency, Mr Blaney referred to the operating limits and the inability of the existing network capacity to allow the most efficient generators to transport energy to demand customers. This results in a less efficient and more expensive generators being scheduled by the system operator, which creates additional costs that are borne by the consumer. He highlighted the fact that the current lack of a second interconnector is a major constraint on the all-island system resulting in additional constraint costs that are borne by the customer and which impacts on Irish competitiveness.

He concluded that as both the independent Irish electricity regulator and as part of the all-island SEM, the CER consider that the North-South Interconnector will bring a range of benefits for electricity consumers in both jurisdictions. It will bring both security of supply and reduce the wholesale cost of electricity by allowing the system operator to schedule the most cost effective set of generators for the island of Ireland. He concluded that there is a clear and pressing need for the development and that any material delay in its delivery is not in the interests of all island electricity consumers.

Mr Owen Wilson (Electricity Association of Ireland) stated that the development as proposed is central to the delivery of a number of key Government objectives in the field of energy and environment. The Government White Paper and Northern Ireland's *'Strategic Energy Framework 2010-2020'* endorse the delivery of the proposed interconnector and the importance of the development in terms of

security of electricity supply, optimising investment in renewables and reducing costs to customers. He stated that the maintenance of the SEM is in the national interest, both in terms of Ireland's strategic economic and social development and in terms of Ireland's relationship with a neighbouring state. Furthermore, the development was an important component in the delivery by the State and Northern Ireland of EU policy objectives.

He noted the aim of European energy policies to drive the transition of its energy system to one that will be almost fully decarbonised by 2050. He also noted the legally binding renewable energy targets adopted by both Ireland and Northern Ireland, the financial sanctions if not delivered, and that the opportunity the proposed development would create to maximise the efficient development of renewable generation.

Mr Mark O' Mahony (Chambers Ireland) noted Ireland's heavy dependence on energy security with a preponderance of high energy industry. He stated that the risk posed by a single point of interconnection is not acceptable to industry in a developing economy. Security of supply is a necessity and any issues surrounding it would damage our reputation as a place to do business. He supports the increased interconnection as a necessity. It will bring energy security benefits and will remove the bottlenecks, which are a factor in increased prices and competitiveness. It will allow Ireland and Northern Ireland to expand their green energy productions to meet our international obligations and support the low carbon sector, which would support sustainable economic growth in both jurisdictions going forward.

He also stated that the development will also support balanced regional economic development in line with national policy including the Government's Action Plan for Jobs, IDA policy on investment outside the GDA etc. It will help to attract inward investment and make the regions more attractive for the type of development Ireland is trying to attract such as ITC, data centres and pharmaceuticals, all of which are heavily dependent on energy use and security of supply.

This position is also supported by Mr Ian Hoy (CBI NI) who reiterated the strategic importance of the development to the economies of both jurisdictions in terms of security of supply, the potential to attract inward investment and the potential for reputational damage if the development does not proceed.

Mr Neil Walker (IBEC) stated that the organisation sees a pressing need for the development which will have a net benefit for all electricity users on the island of Ireland and have wider benefits for both economies. At present the limited interconnection between the two jurisdictions which means that in the event of an unplanned outage, even for a short period, there could be serious consequences for electricity users and could impair our ability to attract and secure foreign direct investment. He noted three complimentary benefits for energy users. Firstly, the development will improve the security and resilience of the electricity system and reduce the risk or surges and outages which will help to make inward investors more confident in choosing Ireland as a place to do business. Secondly, it will help to improve the efficiency of electricity generation in both jurisdictions thereby helping to keep costs down. This will enhance the international cost competiveness of exporting business. Thirdly, it will help Ireland and Northern Ireland to meet out legally binding targets for renewable energy.

Mr Walker also noted the EU ‘s commitment to achieve a 40% reduction in greenhouse gas emissions by 2030 compared to 1990. He stated that this cannot be achieved unless the power system across Europe is progressively decarbonised. The lack of a meshed interconnection across the border with Northern Ireland will increasingly restrict our ability to make good use of our huge wind resource. Renewable energy will be constrained and our reliance on fossil fuel plant will continue.

Conclusion

I do not accept the position adopted by the observers that the strategic need for the proposed development has not been established. The strategic need for this development is accepted at both EU and national level. It is endorsed by Government, by regulators and by industry as a strategically important element of

the electricity transmission system going forward. It has been demonstrated that it will remove the bottlenecks and constraints that currently exist to the transfer of power between Ireland and Northern Ireland, which prevent the effective and efficient operation of the single electricity market and the wider European integrated energy market. The operation of an unrestricted market will have benefits for the economies of both jurisdictions and reduce costs to electricity consumers. It will improve security of supply and facilitate increased penetration of renewables supporting the core objectives of European and national energy policy i.e. sustainability, security of supply and competitiveness.

5.2.4.2. Reinforcement of the existing interconnector would provide the same results

It is contended by the observers that the existing interconnector is not used to its full capacity and that any deficiencies that do exist could be addressed by the reinforcement of the existing line. It is also contended in the submissions that no evidence has been produced to suggest that the existing transmission line is under pressure and that no outages have been attributed to shortcomings of the line. The need for a new interconnector with a capacity of 1500 MW is also questioned.

Technical need for a new interconnector

The technical need for a new interconnector is comprehensively addressed in the EIS and in the report *entitled 'The Need for a second North-South Electricity Interconnector'* (EirGrid and SONI, May 2015) included in Appendix 2.1 Volume 3B Appendices.

The existing Louth-Tandragee 275 kV double circuit overhead line forms the only effective large-scale interconnection pathway between the transmission networks of Northern Ireland and Ireland. The fact that both circuits are supported on the same set of towers means that there is a risk of failure and outages arising from single events such as lightning strikes, damage to a tower structure etc. If such an event were to occur, interconnection between the transmission systems north and

south of the border would be lost resulting in ‘System Separation’. In this situation the transmission systems in Ireland and Northern Ireland would revert to operating independently of each another. This could result in loss of load in one or either systems as power transfer and mutual support cannot occur.

The operation of the networks must take this into account to ensure the transmission system is capable of dealing with this contingency. This is achieved by imposing transfer capacity restrictions on the existing connector to a level where generation/load imbalance resulting from system separation can be managed in both systems without widespread black-outs.

Therefore, to ensure system stability, power flows on the existing interconnector are limited to well below its nominal capacity. Whilst in theory each of the two circuits of the existing interconnector have the ability to carry 750 MW of power at its maximum level, the actual total transfer capacity is limited to approximately 450 MW (some capacity must be maintained for emergency response between the two systems). This ensures that if there was to be a sudden loss of interconnection, the shock to the network could be managed, without risking a collapse of one or both systems. This explains the question asked by Dr Andrew (NEPPC) why the existing interconnector is not operated to design.

This lack of adequate transfer capacity seriously limits the scope for commercial exchanges of electricity between generators and suppliers and leads to inefficiencies and costs that are passed on to final customers. It also limits the amount of wind generated power that can be absorbed into the system. These limitations mean that electricity cannot be traded in an effective way to facilitate the full benefits that an all-island electricity market should deliver. The cheapest produced electricity cannot be physically transferred to where it is required at all times of the year. The bottleneck exists as a consequence of only having one high capacity interconnector between the transmission system of Ireland and Northern Ireland and it affects the strength and resilience of both transmission systems.

Mr Norton (EirGrid) in his response to the oral hearing noted a meshed network around Ireland and Northern Ireland operates in such a way that if one high

capacity circuit is lost, there is always another way to re-route the power. This is not the case in the meshed networks *between* the two jurisdictions. There is only one high capacity circuit connecting Ireland and Northern Ireland, with no alternative to re-route the power in a case of system failure.

I accept that reinforcement will not remove the security and reliability issues associated with the existing interconnector as contended by the observers. I accept that it has been demonstrated that the only technically feasible way to address the issue of system separation is by the provision of a second interconnector, physically separate from the existing interconnector to remove security of supply issues, increase transfer capacity and facilitate increased penetration by renewables, permitting greater trade in electrical power which will benefit both jurisdictions.

Why is a new interconnector with a nominal capacity of 1500 MW required?

Having established that a new interconnector is required, one of the questions raised by the observers is why it needs to have an electrical transmission capacity of 1500 MW. During his submission to the oral hearing Mr Nigel Hillis (CMAPC) stated the demand for such power flows had not been adequately demonstrated. Dr Colin Andrew (NEPPC) also questioned why a capacity of 1500 MW is required. He noted that each of the circuits on the existing interconnector could in theory carry 750 MW but the Total Transfer Capacity (TTC) is ‘self-limited’ by the Transmission System Operators (TSO’s) to approximately 450MW. It was his contention that the project is designed at a capacity that significantly exceeds what is needed. He noted that the overall electricity demand is generally falling and that the design capacity of 1500 MW is very unlikely to be ever needed.

The requirement for a capacity of 1500 MW is explained in terms of the capacity that is required by the Single European Market (SEM) for transferring power between the two jurisdictions. Since the commencement of the SEM, it has been demonstrated (Fig 3.3 & Fig 3.4 of applicant’s response) that there have been

unrestricted market flows on a regular basis in excess of 750 MW and at times up to a magnitude of 1,100 MW between Ireland and N. Ireland.

Mr Norton, on behalf of EirGrid, noted that a new interconnector with a capacity lower than 1100 MW would immediately reach a transfer capacity limit between the two jurisdictions, which would continue to restrict the SEM for transferring power between Ireland and Northern Ireland. The capacity of 1500 MW allows for future growth and better use of generation portfolios in both jurisdictions.

He also stated that the capacity is required as a result of the existing meshed system in Ireland and Northern Ireland, which is rated at 1500 MW. To create an undersized circuit linking these two 1500 MW networks with a smaller sized circuit would create a bottleneck. This would result in circuit overload and safety issues and the circuit would inevitably be taken out of service. A capacity of 1500 MW is required to ensure that the power flows freely between the two existing systems and to ensure that loss of capacity and underutilisation of existing capacity does not occur. He also stressed that as this is a long term solution, one of the fundamental reasons for the 1500 MW is the delivery of a reinforcement that would keep the losses down on the system on an asset that will be in existence for a long time span.

I accept that it has been adequately and comprehensively demonstrated by EirGrid why the proposed new interconnector needs to be rated 1500MW.

5.2.4.3. <u>The development is required to supply power to Northern Ireland, UK and Europe and is of no benefit to people in the south or local communities.</u>

It is contended by the observers that Northern Ireland's energy security problems are exaggerated. During the oral hearing Mr Nigel Hillis (CMAPC) stated that the need for the development is clearly Northern Ireland's need and was not necessary to 'keep the lights on' south of the border. He referenced to '*Your Grid, Your Views, Your Tomorrow*' (EirGrid 2015), which states that the Northern Ireland is likely to need more generation imports from Ireland at times of high demand in

the next decade, in order to balance supply and demand and maintain security of supply.

He queried why no efforts were being made to replace unsuitable plant with more modern clean plant to address generating deficits in Northern Ireland. It was also his argument that there is no evidence that the proposed development would be mutually beneficial to the south and that the savings to consumers are totally illusionary.

The security of supply issues in Northern Ireland arise due to changes in conventional generation and the retirement of generating plant. The *'All Island Generation Capacity Statement 2014-2023'*, produced jointly by EirGrid and SONI, outlines the expected electricity demand and the level of generation capacity available on the island over the next ten years. It states that three factors combine to increase the risk of security of supply in Northern Ireland. These included decommissioning of existing units at the Ballylumford plant, a fault on the E-W interconnector and limited capacity reliance on the existing North-South interconnector. From the start of 2016 onwards, the ability of the generating plant to meet the electricity demand is expected to come under increasing pressure. Furthermore, from 2021 output from Kilroot is expected to be curtailed due to emissions legislation and generating capacity will be unable to meet demand.

Since the application was lodged the new 'All Island Generation Capacity Statement 2016-2025' has been published. It notes that security of supply in the north has been stabilised by local reserve services at Ballylumford and that the Moyle interconnector is expected to be fully restored by 2016. Whilst this improves the situation in the short term, it is expected that there will be security of supply issues post 2021 due to emissions restrictions at Kilroot.

There is currently a surplus of generating capacity in Ireland but due to the limited size of the existing interconnector the power that can be transferred is restricted. This bottleneck prevents the cheapest available generators from supplying electricity demand at all times and the sharing of wind energy across the island,

which results in increased costs for consumers and the full benefits of the SEM not being realised.

There is no evidence that the security supply issues of Northern Ireland have been exaggerated as stated by Dr Andrew (NEPPC). Mr Norton (EirGrid) noted that EirGrid has legal and licence responsibilities for monitoring and reporting on the security of supply and each year a generation capacity statement is published that outlines the security of supply for Ireland, Northern Ireland and the island as a whole. The 'All Island Generating Capacity Statements 2016-2025', notes that post 2021 there are concerns regarding security of supply in Northern Ireland. This was re-affirmed in the submissions to the oral hearing by Mr Garrett Blaney (CER), Mr Mark Norton (EirGrid) and Mr Ian Hoy (CBI NI), all of whom noted that problems facing N. Ireland post 2020.

Whilst I accept that security of supply issues are currently more urgent for Northern Ireland, I do not accept that the proposed new interconnector is purely for Northern Ireland's benefit. There are significant costs associated with the inefficient operation of the single electricity market, which effects consumers both north and south of the border. Mr Norton (EirGrid) also pointed that Ireland was in a similar position 12 years ago and could be again, noting that Moneypoint and peat generators would have to retire in the future due to emissions considerations. He stated that the balance of flows change over the years and that power flows could be predominantly in a north to south direction in the future.

The new interconnector will enable both jurisdictions to rely on each other's generation portfolios into the future. This will facilitate the effective operation of the SEM, and that demand for electricity is met in the cheapest possible way. It will remove the bottleneck that currently exists, preventing the cheapest produced electricity produced on the island of Ireland being transferred to where it is required at all times of the year. The efficient running of the SEM will have positive implications for the economies of both jurisdictions. Enhanced security of supply coupled with reduced electricity costs will make the island of Ireland a more attractive place to do business and enhance national competiveness. The security of supply benefit of the interconnector is, therefore, not exclusive to one

jurisdiction or the other. Whilst these benefits may appear to be more obvious for Northern Ireland in the short term, the communities on both sides of the border will benefit.

5.2.4.4. The project should have been subjected to the same government review process as other EirGrid projects.

Mr Hillis (CMAPC) challenged the need for the development in its current form on the basis of the significant changes that have taken place following the review of two other flagship projects i.e. Grid Link and Grid West. He queried how EirGrid could be trusted when they say that the project can only be delivered using an overhead line, based on the changes that have taken place regarding the other two projects.

Responding to questions from the Inspector on the rationale for the alterations to the Grid Link and Grid West projects, Mr Norton (EirGrid) noted that these are very different projects and the changes that have occurred are for very different reasons. He stated that it was very important to note that the 'need' driving both these projects is also very different to the proposed North-South interconnector development.

In the case of Grid West, its primary driver is to capture increasing levels of renewable energy generation from north Co. Mayo and connect it into the electricity transmission network. The original proposal was to construct a 400 kV OHL. Following a review of the project three options were explored including a fully underground direct current cable, a 400kV overhead line and a 220kV overhead line with partial use of underground cable. Mr Norton stated that the entire need for this project is based on the connection of renewable generation. He noted that EirGrid continuously reviews the need for strategic infrastructural projects such as Grid West. It also monitors the status of the proposed renewable energy projects in north Mayo and if the amount of renewables seeking to connect to the grid altered significantly, this would require a review of need.

The primary reason for the Grid Link project is also to accommodate the increase in renewable generation arising in the south west of the country. Following a review of the project and a reduced demand growth rate, it was confirmed that the needs of the project could be met without building new large scale overhead line infrastructure. A technology called ‘series compensation’ will be used, which will enable more power flows on the existing lines and accordingly there is no requirement to proceed with the originally proposed 400 kV OHL. Mr Norton confirmed that this technology is possible as there are multi circuits in the south west and in Dublin, some of which are not currently being used to full capacity.

Mr Norton noted in his submission to the hearing that the situation for the north-south interconnector is entirely different. In this case, the need is to ensure reliability and security of supply and to enable the functioning of the all-island electricity market and an integrated European electricity market. He also noted that changes in demand or reduction in demand that affects other projects such as Grid Link does not affect this project.

I accept that it has been demonstrated that proposed north-south interconnector has a very specific need, which makes it different from other projects. I accept that it has been demonstrated that the grid needs 1500 kV and this cannot be added on to the existing circuit for the reasons outlined above. The requirement for a nominal capacity of 1500 MW means that 400 kV line is required and this places limitations on the type of technologies that can be considered, which is discussed under Alternatives.

5.2.4.5. <u>The need for the project independently of the previous application must be demonstrated.</u>

Dr Colin Andrews (NEPPC) questioned the real need for the current proposal, noting that statements over need have varied from year to year. In his submission to the oral hearing he referred to early documents published by DCENR (2007) and EirGrid (2009), which placed significant emphasis on the need for the interconnector to ensure security and reliability of supply to the north-east region. He noted that by 2013 the reinforcement of the north-east had disappeared from

key drivers and questioned why this is the case. Mr Hillis (CMAPC) raised similar issues noting that during the oral hearing for the previous development EirGrid built a technical case and established a need for the development of a sub-station near Kingscourt, which was not now part of the current proposal.

Mr Norton (EirGrid) stated that the need to reinforce the north-east is driven by the level of local demand. With the downturn in the economy experienced over the last number of years, the urgency to reinforce the area was deferred. Using the median demand forecasts from the *All Island Generation Capacity Statement 2015-2024*, it was found that the peak demand in the area will still be below the critical level for in excess of 10 years. Unless there is stronger recovery in the economy than predicted and/or large consumers emerge, reinforcement of the network in the area for security of supply reasons is not likely to be required within the next 10 years. The need to reinforce the north-east is therefore not an immediate driving factor for the proposed interconnector and the intermediate substation originally proposed connecting into the Flagford-Louth 220 kV OHL is not required.

Mr Norton noted that once the second interconnector becomes operational, it would reduce the amount of power flow on existing 220kV and 110 kV networks in the north-east. This will address some of the capacity issues that have arisen in the area and based on current predictions will provide sufficient additional transmission capacity in the area to cater for growth in electricity consumption for at least 10 years. It will also put the north-east in a strong position if demand increases due to stronger economic recovery or emergence of large consumers such as data centres.

I accept that transmission infrastructure planning is a dynamic process and requirements for transmission services are constantly evolving with changes in demand and supply conditions. I accept that EirGrid, is required to keep these changes under constant review and that current modelling suggests that reinforcement of the part of the network to the north-east is not required at the present time. As already noted in the EIS, the need for the north–south

interconnector is not driven to any material degree by the decline in national electricity consumption that has resulted from the economic downturn.

5.2.4.6. The input of wind energy as a rationale for the development is overstated.

Mr Hillis (CMAPC) in his submission argued that a development of this scale is not required for renewables. He stated that unlike Grid West, which is a bespoke power line to cater from priority dispatch of wind from Mayo, there is no wind power in the midlands that requires any such power line to cater for wind. He contended that a second interconnector of 1500 MW is not required to meet demand, nor, is it required to meet priority dispatch of wind either from the Republic of Ireland or Northern Ireland.

It is recognised at both European and National policy level that a radical transformation of Europe's energy system is required to meet climate change and energy objectives. Significant greenhouse gas reduction targets as well as renewable energy and energy efficiency targets have been agreed by Member States to combat climate change and to deliver the energy policy objectives of sustainability, security of supply and competiveness. Achieving these targets and the transition to a low carbon economy will require a progressive move away for carbon intensive fuels such as coal and peat, in and increasing the share of renewables sources including wind.

It is accepted at EU level (*ENTSO-E 'Ten Year National Development Plan', 2014*) and at national level (*Ireland's Transition to a Low Carbon Energy Future2015-2030)* that achieving European energy policies and the transition to a low carbon future will require changes to the transmission grid, including increased interconnection. Ireland with Great Britain are identified in the TYNDP 2014 as one of four main 'electric peninsulas', which have high Renewable Energy Source (RES) development prospects and that require increasing interconnection capacity to enable the development of wind and solar generation and stronger market integration. The proposed North-South Interconnection development is identified in both policy documents as a project, which will facilitate RES integration.

The Governments in both jurisdictions have adopted a target of generating 40% of all electricity consumed from RES by 2020. To achieve this target significant amounts of renewables will connect into the transmission system over the next number of years. Moving to higher levels of renewable energy penetration requires changes to the existing transmission system and would require further interconnection so as to ensure security of supply is maintained.

It is the clear intention at both European and national level that renewables will form an increasing part of the energy portfolio going forward and that the transmission system will require enhancement to ensure these objectives are realised. The proposed interconnector is identified as a strategic element of the transmission system, which will facilitate the increased integration of renewables into the transmission system and provide security of supply which is crucial to the achievement of both European and national energy goals in both jurisdictions. Having regard to the foregoing, I do no, therefore, t consider that there is merit in the observers' arguments that the contribution of wind energy as a rationale for the development is overstated.

I would also point out to the Board that Mr Owen Wilson (Electricity Supply of Ireland) brought to the attention of the oral hearing a number of significant recent developments in EU legislation and strategy, which he said add further weight to the need for the development and which have arisen since the lodgement of the application. These include the EU's Communication on Climate and Energy Framework to 2030, COP21[4], the Alternative Fuels Infrastructure Directive 2014, the EU Strategy on Heating and Cooling 2016 and the Climate Change and Low Carbon Development Act, 2015. Each sets out measures to support the delivery of EU energy and climate change policies and objectives, such as increased production of electricity from low carbon sources, improved interconnections between Member States to achieve new renewable energy targets, improvements in energy efficiency and reductions in greenhouse gas emissions.

[4] COP21 also known as the Paris Climate Conference 2015, which aimed to achieve legally and binding agreement on climate change.

5.2.4.7. A cost-benefit analysis of the development was not undertaken

The subject of cost benefit analysis was raised both in the submissions and at the oral hearing. Dr Andrew (NEPPC) noted that EirGrid has never produced any form of economic model and have failed to demonstrate the economic viability and thus the need for the project. He argued that whilst EirGrid claims security of supply benefits arising from the development, it is unclear how these will be passed on to the consumer and the reduction in the cost of power that would result. It was his contention that the project should be evaluated on its economic merits, as a stand-alone project to see if it is economically justified.

Transmission System Operators for Electricity (ENTSO-E) has developed a Cost Benefit Analysis methodology to identify transmission projects that significantly contribute to European energy policies and that are robust enough to provide value for society, while at the same time being efficient in order to minimise costs for consumers. It provides a set of common indicators for the evaluation and assessment of all projects included in its Ten Year Network Development Plan (TYNDP) and PCI's. It facilitates a comprehensive assessment of project in terms of costs, overall benefits to society and in terms of social and environmental impacts. The North South Interconnector project is identified as a project of pan-European significance in the TYNDP 2014 (Project 81) and has been evaluated against the established criteria. This establishes the need for the development and its overall benefits to society.

In his submission, Mr Mark Norton (EirGrid) noted the statutory and licence obligations placed on EirGrid to develop the transmission system in a cost and efficient manner having due regard to the environment. This he said frames the cost benefit approach EirGrid adopts and the requirements placed upon them. He stated that EirGrid takes into account the costs and benefits associated with need and these are elaborated upon in the EIS

Mr Garrett Blaney, explained CER's role in terms of approving the expenditure of the development of the Irish electricity system. He noted that CER reviews EirGrid's proposed expenditure on the network to ensure it is efficiently incurred

and in the consumer interest. He stated that the CER has reviewed the company's proposed expenditure and judged that on the basis of what was put forward that it is sufficient. He also stated the CER have reviewed the necessity of this development and the expenditure and costs and have accepted the development as necessary for the development of the transmission system.

I accept that a cost/benefit analysis has been carried out in accordance with industry norms and has been accepted by the CER. I accept that this falls short of the observers' requirements in terms of assessing the wider costs and benefits associated with the proposed development and other alternatives. However, I consider that this is a matter which is clearly outside the scope of the Board, which is limited to the consideration of planning matters. I accept that it would be difficult to quantify in monetary terms the wider costs and benefits associated with the proposed development, but that the positive and negative effects associated with the development are identified and assessed in the EIS.

Note: I would point out to the Board that reference was made during the oral hearing to Decision No 1364/2006/EC of 6th September 2006 which required that projects of common interest display economic viability and that a full cost benefit analysis be undertaken. It was confirmed by Mr Brian Murray SC that this was repealed by Regulation No 347/2013 (Article 23) for Annex 1 and 111 projects, which includes priority electricity corridors.

5.2.5. Conclusion

The strategic need for the proposed North-South Interconnector has been established at both EU and national level. It supports the core objectives of European and national energy policy of sustainability, security of supply and competitiveness. It has been established that it is a critical and strategically important transmission reinforcement for the island of Ireland.

It has been demonstrated that there is a clear and pressing need for the development. It will remove existing restrictions that limit cross border flows between Ireland and Northern Ireland. This will enhance security of supply

throughout the island of Ireland and improve competitiveness. It will facilitate the more efficient operation of the single electricity market and a wider European electricity network. It will facilitate greater penetration of renewables allowing both Ireland and Northern Ireland to meet legally binding targets. It will provide benefits to the economies of both jurisdictions and for individual consumers.

The project is identified in Regulation EU 347/2013, as one that should be given priority status at national level.

5.3. Public Consultation

5.3.1. Environmental Impact Assessment

The applicant's approach to public consultation is described in three principal documents:

- The Planning Report (Volume 2A).
- The Public and Landowner Consultation Report (Volume 2B).
- The Common Chapters section of the EIS (Volume 3B).

The Planning Report (Section 2.1.4 and 2.1.5) refers to EirGrid's 'roadmap' of the project development process which indicates the opportunities for public and stakeholder engagement (Figure 2.1, Planning Report and Appendix 4, Volume 2A). It states that the re-evaluation process regarding the proposed development, after the 2009 application to the Board for the Meath-Tyrone 400kV Interconnector was withdrawn, effectively constitutes the process and key deliverables of the EirGrid Roadmap 2012.

The Public and Landowner Consultation Report (Volume 2B) summarises the obligations on EirGrid regarding consultation under the Aarhus Convention, the Consolidated EIA Directive, requirements under Section 182A of the Planning and Development Act 2000 (as amended), best practice and Project of Common Interest regulations. It:

- Sets out EirGrid's overall approach to, and principles in respect of, public consultation (accessible, meaningful and accountable),
- Documents the various consultation activities that have occurred since 2007, and
- Describes how feedback received has been captured and considered by the project team.

Chapter 7 of this report outlines the separate and parallel process of consultation undertaken with landowners potentially affected by the proposed development. Chapter 3 of the Common Chapters volume of the EIS (Volume 3B) provides information on consultation carried out for the proposed development, relevant to the EIA process. It includes reference to:

- Feedback from the public, interested parties and statutory bodies arising from the previous application and the re-evaluation of the project which has informed the current application, and
- Issues raised in pre-application consultation with the Board and in consultation with prescribed bodies, other interested parties, transboundary bodies, the public and landowners which have informed the current application for the proposed development.

5.3.2. Policy Context

Public consultation and engagement with the application process for the proposed development is provided via the following principal instruments:

Section 182A of the Planning and Development Act 2000 (as amended) prescribes the application process to the Board for electricity transmission lines. Section 182E requires prospective applicants to enter into consultations with the Board with regard to procedures involved in making the application and the matters to be considered. The prospective applicant may also seek (also under Section 182E) an opinion on the information to be contained in an environmental impact assessment and the Board is required to provide this opinion after consulting the applicant and prescribed bodies. Section 182A also requires public notification of the application for approval and Section 182B requires that prior to making a decision in respect of the proposed development that the Board consider the submissions or observations made in respect of the development.

The Aarhus Convention (UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters) was ratified in Ireland in June 2012. It lays down basic rules to promote the involvement of citizens in environmental matters and improve enforcement of environmental law. It has three pillars: access to information, public participation in decision making and access to justice. Development which is specifically referred to in the Convention includes the construction of overhead electrical power lines with a voltage of 220kV or more and a length of more than 15km (Annex I).

Requirements arising from the Convention have been implemented via EU law and include the consolidated EIA Directive 2011/92/EU which seeks to ensure that the public shall be informed of matters early in the environmental decision making procedure. Article 6(4) of the Directive states *'The public concerned shall be given early and effective opportunities to participate in the environmental decision-making procedures referred to in Article 2(2)*[5] *and shall, for that purpose, be entitled to express comments and opinions when all options are open to the competent authority or authorities before the decision on the request for the development consent is taken'.*

The proposed development falls within Part 1 of Schedule 5 of the Planning and Development Regulations 2001 (as amended) and requires mandatory EIA and the Board, as competent authority, is expressly required to carry this out (Section 172, Planning and Development Act 2000, as amended).

Section 171A of the Act defines environmental impact assessment as *'an assessment, which includes an examination, analysis and evaluation, carried out by a planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that shall identify, describe and assess in an appropriate manner, in light of each individual case and in accordance with Articles 4 to 11 of the Environmental Impact Assessment Directive* [and therefore expressly including Article 6(4) above]*, the direct and indirect effects of a proposed development ..'*

Article 3(4) of Regulation (EU) No. 347/2013, Guidelines for trans-European Energy Infrastructure, enable the European Commission to establish a list of priority projects, Projects of Common Interest, to improve European energy infrastructure and in particular to provide interconnections across borders in the interest of security of supply and to develop renewable energy sources. Article 9

[5] This article states that environmental impact assessment may be integrated into existing procedures for development consent or other procedures to comply with the Directive.

deals with 'Transparency and Public Consultation'. In particular, it requires the following:

1) The Member State or competent authority to publish and make available to the public a manual of procedures for the permit granting process applicable to projects of common interest.
2) Without prejudice to the requirements of Aarhus and Espoo Conventions and relevant Union law, all parties involved in the permit granting process to follow the principles for public participation set out in Annex VI.3. This Annex states that '*The stakeholders affected by a project of common interest, including.. landowners and citizens living in the vicinity of the project, the general public and their associations, organisations and groups, shall be extensively informed and consulted at an early stage, when potential concerns by the public can still be taken into account and in an open and transparent manner'.*
3) The project promoter, within an indicative period of three months of the start of the permit granting process, to submit a concept of public participation to the competent authority, with competent authority approving same (with or without modifications) within three months.
4) The project promoter to prepare a report summarising the results of activities related to public participation and to submit this with the application to the competent authority, with due account to be taken of these results in the comprehensive decision.

The Board is the competent authority for projects of common interest in Ireland and in September 2014 published a manual of procedures for the permit granting process (www.pleanala.ie).

In their observations on the application for the proposed development observers refer to the Gunning Principles[6]. These principles have been established via UK case law and comprise the following in respect of public consultation:

1) Consultation must take place when the proposal is still at a formative stage.
2) Sufficient reasons must be put forward for the proposal to allow for intelligent consideration and response.
3) Adequate time must be given for consideration and response; and
4) The product of consultation must be conscientiously taken into account.

5.3.3. Issues raised by observers during the course of the application and during the oral hearing

The issues raised by observers can be summarised under the following headings:

- Public consultation occurred too late in the project development cycle.
- Public participation in respect of strategic policy documents was inadequate.
- Inadequate process of public consultation.
- Public consultation and PCI process.
- Oral hearing proceedings.
- Other matters.

The applicant's response to the issues raised is contained in Chapters 1, 2 and 4 of EirGrid's submission to the Board of the 19th October 2016.

[6] Source: http://www.adminlaw.org.uk/docs/18%20January%202012%20Sheldon.pdf [accessed on 4th February 2016].

5.3.4. The Oral Hearing

Public Consultation was principally addressed in Module 1.4 on March 9th 2016 (Day 3 of the hearing). Issues were also raised during the discussion on Legal Matters (Module 1.3) and during Part 2 of the hearing by representative groups (CMAPC and NEPPC) and numerous individuals. Submissions were made by the following observers in Part 1:

- Esmund Keane, Senior Counsel, NEPPC.
- Michael O'Donnell, Senior Counsel, Braccanby Irish Farms LLC.
- Dr. Padraig O'Reilly, NEPPC.
- Nigel Hillis, CMAPC.
- Alan McAdam, CMAPC.

In attendance for EirGrid were:

- Brian Murray, Senior Counsel.
- Jarlath Fitzsimons, Senior Counsel.
- Nessa Kane-Fine, Senior Communications Specialist, RPS.
- Des Cox, Senior Planning Consultant, EirGrid.
- Shane Brennan, Project Engineer, EirGrid.
- David Martin, Senior Communications Specialist, EirGrid.

5.3.5. Assessment

5.3.5.1. Public Consultation Occurring Too Late in the Project Development Cycle

The observers draw the Board's attention to their concerns that public consultation has commenced after significant decisions have been made in respect of the project, in particular, the technology to be used and route selection (including the location of the border crossing). They argue that it therefore fails to comply with the Aarhus Convention, EIA Directive, Regulation 347/2013 and the Gunning Principles which require early and effective public consultation.

Concerns were also raised whether the Board has powers to modify the development to comply with these requirements i.e. are all options still open to the Board before their decision on development consent is taken.

The proposed interconnector project has been progressed over a number of years with public consultation initially commencing in October 2007, in respect of the previous application for approval. From my review of the documentation on file, it would appear that decisions had been made by the applicant regarding certain aspects of the development prior to the earliest rounds of public consultation in respect of the project and more latterly for the proposed development. For example:

- It is clearly stated in Section 4.1 and 4.2 of the Public and Landowner Consultation Report (Volume 2B) that the purpose of this first phase of public consultation in respect of the project (in 2007) was '*to introduce the public to the proposed project, the route corridor options and the basis for same (with reference to constraints)*'.
- Similarly, in respect of the proposed development, I note that in meetings with the Board in January 2011, the applicant stated that undergrounding would not be the favoured technology in respect of the development (on grounds including environmental impacts, costs and difficulty in identifying faults).

The applicant's approach would appear to be inconsistent with the requirements for public consultation set out in current European directives and as transposed into Irish law. However, I note that the earliest round of public consultation took place prior to Ireland's ratification of the Aarhus Convention, the coming into effect of the consolidated EIA Directive and the adoption of Regulation 347/2013 (see above).

Furthermore, as a consequence of the public consultation exercise that was held for the previous application, the use of alternative technology has been revisited, considered and assessed by the applicant and government during the course of the preparation of the current application.

Relevant reports commissioned by government, the applicant and the industry are referenced and summarised in Chapter 4 of Common Chapters Volume of the EIS (Section 4.6, Volume 3B) and include the following documents which considered alternative transmission technology:

- The PB Power Study (Parsons Brinkerhoff, 2009) and updated studies in 2013
- The Tepco Study (Tepco, 2009).
- The TransGrid Study (TransGrid, 2009).
- The Ecofys Study (DCENR, 2008).
- The International Expert Commission Report (IEC, 2012).

I note that the *Preliminary Re-evaluation Report 2011, Final Re-evaluation Report 2013* and *Preferred Solution Report 2013* all refer to alternative transmission technology and all were subject to public consultation. (The *Preliminary Re-evaluation Report 2011* also clearly sets out the rationale for the study area, the border crossing and the assessment of alternative route corridor options).

I would consider, therefore, that the public have been extensively informed and consulted in respect of the proposed development and on alternative technology. However, the applicant has decided primarily on cost and technical grounds to bring forward the application for the development as an overhead line. It is now for the Board to adjudicate on this proposal. In coming to their decision the Board will consider all of the arguments presented regarding alternative transmission technologies and therefore, in effect, all options are open to the Board prior to decision making.

5.3.5.2. Public Consultation in respect of Strategic Policy Documents

The observers argue that public consultation in respect of strategic policy documents, in particular the National Renewable Energy Action Plan[7] (DCENR, 2010), Grid 25 (EirGrid, 2008) and Your Grid, Your Views, Your Tomorrow (EirGrid, 2015) were inadequate and therefore incomplete and provide an erroneous policy context for the project.

[7] The observers argue that the NREAP was also not subject to SEA.

Under statute the Board is responsible for adjudicating on applications made to them under the planning acts. It has no jurisdiction in the making of government (or other) policy but must have regard to it, and if necessary weigh one policy provision against another, in decisions on applications for development. The matters raised by observers in respect of the adequacy of strategic policy documents therefore lie outside the scope of this assessment.

5.3.5.3. Inadequate Process or Public Consultation

The observers raised a number of concerns regarding the adequacy of the public consultation process, in particular:

- The objective of the public consultation exercise.
- The methodology of public consultation.
- Accuracy of material provided for public consultation (EMF and You).
- The identification of, and consultation with, landowners.
- Consultation with regard to alterations to tower locations.
- Change request forms.
- Consultation with regard to proposed temporary access routes.
- Feedback on public consultation.
- Excessive fee/cost of application.

The Objective of the Public Consultation Exercise

During the oral hearing the observers acknowledged the extensive public consultation exercise carried out but considered this to be a box ticking exercise with no meaningful engagement. They argued that the process was little more than an information gathering exercise, for the benefit of the applicant, focused on site specific issues which offered no real input to the nature or form of the development. They pointed to the lack of substantive change to the project since 2007, the significant number of submissions made in respect of the current application (which exceed that of the previous application) and the lack of public acceptance of it.

The public consultation exercise carried out by the applicant and described in the application documentation is extensive. At each stage, it has generated substantial public interest and observations on the proposed development. The applicant has comprehensively responded to the issues raised by the observers and this has included the commissioning of technical reports to address issues and concerns raised.

Notwithstanding this, I would accept the observer's argument that the applicant's response to the issues raised has been essentially site specific. For example, moving the pylons away from hedgerows, maximising separation distances from dwellings, locating a pylon outside Cashel Bog (Table 3.1, Appendix G, Volume 2B). More substantial changes to the project sought by the public, for example, an underground option, have been acknowledged and examined by the applicant, but as stated previously the applicant has chosen to go forward with the proposed development as an overhead line, on cost and technical grounds. Therefore, whilst I would acknowledge that there has been a lack of substantive change to the project since 2007, I would not accept that the public consultation exercise has been inadequate or meaningless.

The Methodology of Public Consultation

The observers raised concerns regarding the methodology adopted towards consultation. They argued, for example, that the approach adopted:

- Did not meet the needs of the rural community,
- Was channelled through the internet in an area where there was limited access/use,
- Did not engage directly with landowners as a group,
- Was confrontational, heavy handed,
- Did not respect the wishes of landowners/representative groups (cold calling),
- Was not easy to engage with,
- Provided inadequate information (confusing booklets, consultation staff could not answer questions posed, suffered from information overload),

- Did not meet the needs of all members of the public (e.g. those with dyslexia)[8].

The observers also drew attention to the late appointment of Community Liaison Officers and Agricultural Liaison Officers and the poor organisation of public meetings.

Public consultation over the various phases of the project is documented in the *Public and Landowner Consultation Report*, (Volume 2B) and is summarised in the applicant's response to the observations made (Section 4.1.2 of report). Consultation has been multi-faceted and included a project website, three project information centres, a lo-call number, dedicated email and postal address, public meetings, press releases and advertisements at a local, regional and national level and open days. Difficulties encountered by the applicant are also noted for example, feedback outside the terms of reference provided to the public for a consultation event, low attendance at some open days/events and forms of authority and legal instruction precluding the applicant from having direct communication with individuals.

It is evident, therefore that the public consultation process carried out by the applicant has been substantial. However, the project is clearly contentious and public opposition to it has impacted on the process of public consultation, including the ability of the applicant to engage with the public and the willingness of the public to engage with the applicant. Notwithstanding this, as reflected in the number of submissions made and attendance at the oral hearing, there is clearly a high level of public knowledge about the project and significant public participation in the decision making process. I would conclude therefore, in respect of the application before the board, that despite its difficulties, the methodology of the public consultation process has been effective.

[8] Meath IFA argued (Day 11 of oral hearing) that the project was essentially a joint venture with ESB and ESB should have been party to the public consultation exercise carried out. I do not accept this point. The application is made solely by EirGrid of foot of their statutory responsibilities.

Accuracy of Material provided for Public Consultation (EMF and You)

During the oral hearing the Board's attention was drawn by the Irish Doctors Environmental Association to quotations in the EirGrid document 'EMF and You' which was used during the public consultation exercise with regard to the possible health effects of EMFs. They argued that (a) the applicant had implied that the document was a government publication but had in fact been commissioned by EirGrid[9], and (b) that it did not accurately reflect government policy in respect of possible health effects in relation to EMFs[10]. They also raised concerns that other high profile public events (e.g. TV debates) had not reflected the possible health effects associated with EMFs which were referred to in government policy.

I note that the document 'EMFs and You' (EirGrid) does not form part of the applicant's submissions in respect of EMFs in Chapter 8 of the EIS (Volume 3B). Furthermore, the current version of the document which is available from the EirGrid website, and which is therefore in the public domain, now only makes reference to national and international government or agency publications.

In this instance, the Board can only adjudicate on the application before it and, as stated, this does not make reference to the document cited by the observer. Health issues associated with EMFs are discussed in a separate section of this report.

The Identification of, and Consultation with, Landowners

The observers draw the Board's attention to the applicant's failure to correctly identify all landowners in respect of the proposed development and to inform all potentially affected landowners of its intention to place towers on their lands.

I note that landowners, whose land would be affected by the proposed development (towers and overhead line), were initially identified in December

[9] Office of the Chief Scientific Officer for the Irish Government, A Review into Recent Investigations into the Possible Health Effects of Exposure to Electromagnetic Fields (EMF) from Power Lines. Commissioned by EirGrid, 2010.

[10] DCMNR, 2007, Health Effects of Electromagnetic Fields.

2010 by a search of the Property Research Authority of Ireland's (PRAI) database. This landowner information was subsequently updated in searches carried out in April 2013, December 2013, January 2015 and May 2015 (submission No. 67 to the oral hearing).

Consultation with landowners, identified through the PRAI database, took place in phases between 2011 and 2013, with letters to landowners on the 12th December 2013, advising them of the final line design (Section 7.3, Volume 2B). Subsequently, following a final technical review of the line design, 16 landowners were advised of changes affecting them in March 2015 (changes were made to tower locations not to the route alignment). All landowners were also advised of the proposed application in May 2015 and provided with details of the application in June 2015 (the application was lodged with the Board on the 9th June 2016).

During the oral hearing it emerged that:

1. There had been some delays in consultation with a small number of landowners due to (a) changes in ownership and a delay in the registration of details on the PRAI database[11] and, (b) to a lesser extent, the relative infrequency of searches of the database carried out by the applicant. These issues were acknowledged by the applicant and landowners.
2. For all other cases referred to, where landowners stated that they had not been contacted by the applicant or there had been little consultation, the applicant was able to demonstrate that significant attempts had been made to contact the landowner[12].
3. In some 'forms of authority' signed by the landowner, requiring correspondence through a representative, had complicated consultation and engagement with landowners.

[11] For example, in respect of lands owner by Terence Wignal (Tower 244); Alan McMahon (Tower 181); Philip Freeman (Tower 191), Mr Leadham (Tower 119 to 122); Sean Duffy (Tower 149 and 150); Sean Lennan (Tower 158).
[12] Hugh and Damien Woods (T126); Charlie Mulligan (T146); Damien and Patsy Connelly (T170); Des Marron (T177); Alan McMahon (T181); Sean Lynch (T190-191); Francis Clarke (T194); John Smith (T212); Mr Hand (T217); Michael Farrelly (T266); Teresa Buchanan (T333-334); Michael Horan (T342); Hugh and Damien Woods (T126).

Having regard to the above, it would appear to me from the documentation on file and oral hearing proceedings, that the applicant has been able to identify the vast majority of landowners along the route and has made significant efforts to engage with them.

Consultation with Regard to Alterations to Tower Locations

The observers raised concerns regarding the late changes made to the positioning of 11 No. towers (in the CMSA) with little notice or consultation with the 16 affected landowners.

From the information on file it would appear that the applicant wrote to all landowners on the 12th December 2013 advising them of the final route design. However, as a result of a final technical review[13], on the 11th March 2015, the applicant advised 16 landowners of changes to 11 tower locations (not line route). This correspondence preceded the applicant's submission of the revised application file to the Board on the 18th March 2015 under the PCI process and preceded the application for approval submitted to the Board in 9th June 2015.

On Day 3 of the oral hearing Ms Nessa Kane-Fine stated that correspondence in March 2015 was followed up with telephone calls to each affected landowner. Subsequently, meetings were held with 10 landowners and with the Chairman of NEPPC for the remaining six landowners. Furthermore, she stated that the March 2015 the design was widely publicised, for example, by way of local newspapers, the project website and project information centres. Mr Shane Brennan, for the applicant, stated that as a consequence of the meetings some of the landowners had input into the location of towers on their landholding.

Having regard to the above, I would accept the observers' arguments that these changes were made late in the pre-application process and that they could impact on the landowners themselves and on the wider public (e.g. who may be more affected by the position of a tower than a landowner). However, I note that

[13] Section 4.1.5.4, Response Report, EirGrid.

alterations were made to the location of towers only and not to the overall alignment. Furthermore, affected parties were given an opportunity to engage with the applicant prior to the application being finalised and both the landowners and the public were advised well in advance of the application for approval being made to the Board. Consequently, they would have had the opportunity to make submissions to the Board in response to the application made and at the oral hearing. I do not consider therefore that these landowners, or the public, have been significantly disadvantaged by the alterations made to tower locations in March 2015.

Change Request Forms

A number of observers draw the Board's attention to the change request forms which were sent to landowners as part of Phase 2 of the consultation exercise (Appendix I, Volume 2B) in July 2013. These forms enabled landowners to express a preference to where structures might be relocated on their lands. The observers stated that EirGrid would only consider change requests if access was granted to lands for survey.

During the oral hearing the applicant confirmed that change requests were considered only if access was granted to lands for survey. The applicant explained that this was in order to environmentally assess the impact of the change requested, particularly in view of the NPWS representation to site towers in agricultural land to minimise effects on fauna and flora.

As stated earlier in this report, the applicant has been given limited access to lands forming part of the development. Survey work across multiple disciplines has consequently used detailed aerial photography, desk top material and vantage point survey where available to establish baseline conditions. It has been accepted that this approach, as argued by the applicant, has given sufficient information to predict likely environmental effects. In view of this, I consider that it was disingenuous (and inconsistent with their own arguments) for the applicant to use access as a reason to deny landowners change requests.

Consultation with Regard to Proposed Access Routes

During the oral hearing the observers argued that consultation in respect of the proposed access routes was inadequate. For example, the observers argued that they were not aware until late in the process that their lands were being used for access to construction sites, stringing or guarding areas, or that their lands would be used to access construction sites on adjoining lands. In addition, the observers argued that it was unfair that the applicant was able to make changes to the application during the course of the hearing and afforded them little time to consider the proposed alterations.

The applicant is not seeking approval for the use of the proposed temporary access routes. They are included in the application documentation to enable environmental impact assessment of the proposed development. However, as referred to earlier, the consolidated EIA directive requires that the public be given early and effective opportunities to participate in environmental decision making procedures.

It is apparent from the documentation on file that landowners have been advised of the applicant's approach towards construction of the proposed development and of likely indicative access routes during public consultation on the proposed development (e.g. see Section 5.2.5 *Preferred Project Solution Report,* 2013 and Appendix I of Volume 2B). Furthermore, during the oral hearing the applicant clarified that all landowners whose lands would be used for temporary access routes were advised of this on the 25th June 2016, shortly after the application was submitted to the Board on the 9th June 2016.

However, during the oral hearing there was contradictory information presented on who had been consulted. For example, EirGrid stated that landowners whose folio lay within 5m of a private right of way would have been consulted on its proposed use as an access route (Robert Arthur); that owners of all shared access routes were consulted (Shane Brennan) and that in some instances the applicant had relied on the notification of the party enjoying the benefit of the right of way over

lands (Jarlath Fitzsimons). There is therefore an element of confusion regarding who was consulted in relation to the proposed access routes.

Notwithstanding the above, the proposed development has been in the public domain for a considerable period. From an early stage this has included the proposed construction methodology with the use of temporary access routes and the presentation of *'indicative access tracks'* in the project documentation. I would consider, therefore, that there has been adequate public consultation on the applicants' approach to the use of temporary access routes, if not the specific details of each route. As routes are indicative this approach is acceptable.

During the oral hearing the applicant tabled 50 alterations to the proposed access routes and 23 minor deviations (as set out in submission nos. 1, 8, 9, 42, 50, 51, 56, 57, 58, 59, 60 and 61 to the hearing)[14].

Landowners affected by each of the proposed alterations were advised by the applicant during the course of the hearing (submission to hearing dated 13th May 2016[15,16]). The latest changes to access routes were made by the applicant on the 10th May 2016, Day 31 of the oral hearing (submission nos. 56, 57, 58, 59, 60 and 61). Correspondence was sent to affected landowners on the same date, Tuesday 10th May 2016, and the last day of the oral hearing Monday 16th, May 2016.

Landowners, who were notified of proposed alterations to access routes during the course of the oral hearing, were facilitated to make submissions in respect of these changes. Furthermore, information on all alterations to access routes was

[14] These were described as an 'alteration' where the landowner demonstrated the proposed route was not feasible or as an 'alternative' where both routes are viable for the Board's consideration.
[15] Landowners who had drawn the applicant's attention to difficulties with the proposed access route and proposed an alternative route during the course of the oral hearing were not advised regarding proposed changes (i.e. extension of access route indicated along private road to towers 336 and 337, access to towers 177, 179, access to guarding between span 270 and 271 and access to tower 356).
[16] I note that landowners were not advised of minor deviations, typically less than 10m from that originally shown, however, on a small holding these alterations may possibly be significant.

made publically available during the course of the oral hearing. It was also made available on the EirGrid website towards the end of the oral hearing.

Having regard to the very late notice given to some observers regarding changes to access routes and the lack of clarity regarding landowner notification, it is possible that some landowners (and others affected by the proposed use of access tracks) could argue that they had not been given an adequate opportunity to participate in the decision making procedure. However, as stated from an early stage the project documentation in the public domain (and more recently the application for approval) has clearly set out the applicant's approach to the construction of the proposed development with the use of existing agricultural access tracks, lanes etc. as temporary access routes, with indicative routes shown. Furthermore, the application documentation is clear that no approval is sought for the use of these as the development will be constructed under the applicant's statutory powers.

Bearing these factors in mind again, I consider therefore that there have been early and effective opportunities for the public to make submissions on the applicants' approach to the use of temporary access routes, regardless of the very late changes made to the indicative routes.

Feedback on Public Consultation

The observers argue that the applicant gave no detailed feedback on public consultation.

In this regard I refer the Board to Appendices A, C, E and F of Volume 2B (Public and Landowner Consultation Report) of the EIS which review the issues raised in respect of the previous application for approval, the submissions arising out of the public consultation exercise associated with the Preliminary Re-evaluation Report, the Final Re-evaluation Report and the Preferred Project Solution Report. I also draw the Board's attention to the applicant's document prepared in response to the observations made in respect of the application for approval (the Response Document). I consider that this demonstrates that the applicant has provided

detailed feedback on the public consultation carried out in respect of the proposed development.

Excessive Fee/Cost of Application

Some of the observers raised concerns during the oral hearing regarding the fee of €50 payable in respect of submissions to the Board (particularly in view of the monies paid out in respect of the previous application which was withdrawn) and the cost of a copy of the application (€6,000).

The €50 fee paid by observers to the Board is a fee levied by the Board and is to cover the administrative costs associated with the application. I note that the payment of fees has been accepted by the courts (ECJ C-215/06) and that there is no facility to return this fee if an application is withdrawn.

Whilst I note the high cost of a copy of the application, it is substantial and it has been made available by the applicant at no cost to landowner representative groups (NEPPC and CMAPC). It is also available in public libraries, information centres and in local authority offices and is available on the applicant's dedicated application website. I also understand that all landowners have been provided with a copy of the Non-Technical Summary and a CD of the application. I consider therefore that information on the proposed development has been made available to the public at little or no cost.

5.3.5.4. Issues with PCI Process

The observers draw the Board's attention to their concerns regarding the PCI process in particular:

- The PCI process allowed the applicant to correct mistakes on an on-going basis with at least two applications being submitted before the final one,
- The Concept of Public Participation (CPP) had been approved by the Board without input from prescribed bodies,
- The approved CPP is contrary to the requirements of Article 9(4) of the PCI Regulations which require at least one round of public consultation between

the start of the permit granting process and prior to the submission of the application for approval to the competent authority,

- The process of consultation was contrary to the CPP with late changes made to tower locations with little or no notice to landowners,
- The Board should not have accepted the current application in the absence of public and landowner consultation regarding the repositioning of pylons, and
- The dual role of the Board as statutory planning and consent granting body and Competent Authority for PCI raises challenges at public perception and understanding level (e.g. acting as project promoter and adjudicator).

As stated in the section of this report on Legal/Procedural issues, An Bord Pleanála was designated as Competent Authority for Projects of Common Interest in December 2013 in accordance with Regulation 347/2013. The PCI Unit established within the organisation is separate from the Strategic Infrastructure Division. The PCI unit is an administrative unit reflecting the principle role of the Board as competent authority to co-ordinate the issuing of all the consents and decisions required from all relevant authorities and to monitor compliance with time limits agreed for the issuing of such consents. It does not have a promotional role with regard to PCI projects.

The Board's Strategic Infrastructure Division has no review function in respect of the administrative processes of the PCI Unit. It is responsible only to determine the application for approval which is made. The above matters therefore fall outside the scope of this report.

5.3.5.5. Oral Hearing Proceedings

During the oral hearing, the observers raised issues regarding its conduct, in particular that:

- Late changes to the application in respect of access routes had been facilitated,
- The lack of notice to public/landowners re same (i.e. not uploaded to Board website),
- The inaccessibility of the Board's website to elderly landowners who could not track updates,
- Problems with updating of the Board's website (progress of hearing) and the difficulty in attending such a lengthy hearing (i.e. no remote access to the hearing).

The observers argued that the process was skewed in favour of developer, in particular with the absence of observers from some of the topic modules in Part 1.

During the hearing the observers were advised that, mindful of the Board's powers in respect of the application for approval under Section 182A of the Planning and Development Act 2000 (as amended), it was the Inspector's decision to hear submissions on all of the issues arising in respect of the development, to enable the Board to adjudicate on them as a whole (including issues arising in respect of late alterations to access routes and notice to observers). Furthermore, they were advised that the Board, if they so wished, could seek further information in respect of any aspect of the project.

Whilst the Inspector notes the difficulty that some observers may have had accessing Board's website, information on progress of the hearing was also available from the hearing itself (from the Board's administrative officers) and from the Board's offices. It is accepted that on one occasion during the hearing, there was a delay in updating the Board's website for proceedings scheduled for the next day, due to an administrative error. It is also noted and drawn to the Board's attention that the length of the oral hearing made it difficult for observers to attend all aspects of the hearing in which they had an interest. However, the length of

the hearing was also a consequence of the Inspector facilitating any party to engage with any aspect of the hearing, if they so wished.

With regard to the absence of the observers from some of the topic modules in Part 1 of the hearing, this arose as a result of a decision by the main representative groups not to attend because of their opposition to the hearing continuing in light of the alterations tabled by the applicant in respect of access routes. As stated, the Inspector's decision to continue the hearing was made on the basis of wishing to hear all of the issues arising in respect of the proposed development and to present this, in its totality to the Board, for its consideration. Whilst observers were encouraged to attend, their decision not to attend was respected.

5.3.5.6. Other Matters

A number of other matters were referred to by observers:

- Public notice – The observers draw the Board's attention to the absence of site notices along the route. Statutory requirements in respect of the application for approval have been fulfilled and copies of site notices were observed during the site inspection. Having regard to the extent of public interest in the project, its high profile in the media and the information on the project via the dedicated website, project information centres etc., I consider that the applicant has ensured that the public has been adequately informed in relation to the development.
- Community gain – The observers refer to what they considered to be the inappropriate use of community gain during the planning process and its divisive effect on the community e.g. sponsorship of community events, local radio shows. Community gain forms part of government policy on transmission infrastructure (*Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure*, DCENR, 2012). Whilst under Section 182(B)(6) of the Planning and Development Act 2000 (as amended), the Board may attach conditions in respect of community gain, it has no jurisdiction in

respect of the applicant's own policies in respect of community gain that lie outside of application for approval.

- Timescale between reports – The observers draw the Board's attention to the limited time between the completion of the public consultation exercise on the *Final Re-evaluation Report* (April 2013) and the publication of the *Preferred Project Solution Report* (July 2013). They argue that due to the short period of time between reports, the applicant had not given proper consideration to the issues raised by the public. A summary of the matters raised in by the public during the public consultation exercise is appended to the *Preferred Project Solution Report*. Furthermore, in Section 2.2.6 the applicant provides a response to the issues raised. I do not accept, therefore, that the timescale involved between reports prevented adequate consideration of the issues raised.
- Role of other bodies – The observers draw the Board's attention to what they considered to be inappropriate interference in the public consultation process by statements made by other public bodies/government ministers on the proposed development. The public consultation process allows all observers to express their views on the merits of any application for approval. All such views are considered by the Board in their decision making.
- Two stage approach to oral hearing – In line with the process of assessment occurring in Northern Ireland, the observers argued that the oral hearing in respect of the proposed development should comprise two phases, with the first considering legal and procedural matters and the second the merits of the proposal. They argued that such an approach would be more efficient and facilitate voluntary groups. Whilst there may be merit in such a proposal, in this instance it was decided to progress the oral hearing on a modular basis. It was considered that such an approach would also be expeditious and facilitate full participation by the public and interest groups.
- Consultation relative to that held for GridLink and GridWest – The observers argued that more meaningful consultation on GridLink and

GridWest had resulted in positive attempts at resolution of issues of public concern. I note that the three Grid 25 projects are located in different geographical areas and have been brought forward to meet specific and different needs. As a consequence, different technical solutions are viable for GridLink and GridWest which are not viable in respect of the proposed development. I do not accept therefore that consultation has been more meaningful for other projects.

5.3.6. Summary and Conclusion

The key issue raised in respect of public consultation relates to the methodology for, and adequacy of, the applicant's public consultation exercise.

Having regard to:

- The extensive period during which the project has been in the public domain,
- The extensive public consultation exercise undertaken by the applicant, which has included at an early stage different technical solutions in respect of the development and the proposed methodology for constructing it, including the use of temporary access routes and an indication of likely routes,
- The resultant public interest in (and opposition to) the project,
- The wide range of matters raised during the course of the oral hearing, and
- The presentation of these now before the Board,

I consider that the applicant's approach to consultation is adequate to meet statutory requirements, including those of Article 6(4) of the EIA Directive.

5.4. Alternatives

5.4.1. Environmental Impact Statement

The relevant chapters of the EIS are as follows: -

- Chapter 4 (Transmission and Technology Alternatives) Volume 3B.
- Chapter 5 (Route Alternatives) Volume 3B.
- Volume 3B (Appendices) containing reports prepared during the re-evaluation process, and
- Volume 3B (Reference Material) containing other background/historical reports and reference material.

The EIS outlines the main transmission and technology alternatives considered including the form of electrical current (AC/DC) and design (overhead line, underground cable, off-shore submarine cable and partial undergrounding). It also considers alternative support structures.

It reviews specific studies on alternative transmission technologies commissioned jointly by EirGrid/SONI and reports commissioned by government and third parties. It concludes that a 400 kV overhead line is the best technical solution for the proposed development and would be significantly cheaper than an underground cable alternative.

The EIS sets out the rationale for the various route alternatives considered for the proposed development, how these were evaluated against various environmental constraints and how the preferred route was justified. It confirms that mitigation by design has been a fundamental aspect of EirGrid's line design process.

5.4.2. Policy Context

Each of the county development plans make reference to alternatives to overhead line electricity infrastructure.

5.4.2.1. Cavan County Development Plan 2014-2020

The plan (Section 4.7.1) recognises that the underground option is generally used in heavily populated areas where there is no room to install overhead lines. It recognises that overhead lines are faster and easier to repair and do not require excavation activities. It states that underground cabling will be encouraged in heavily populated areas, if feasible.

Objective PIO106 – Specifies the need for consideration and independent assessment of most appropriate technologies including undergrounding (for transmission lines) for development requiring approval under the Strategic Infrastructure Act, 2006. Applications should consider in full the impacts of siting of electricity power lines on the landscape, nature conservation, archaeology, residential and visual amenity.

5.4.2.2. Monaghan County Development Plan 2013-2019

The Plan supports electricity improvements and installations that will not result in adverse impacts on the natural or built heritage of the county. Chapter 15 Development Management Guidelines includes Policy EGP 3 which states:

> '*The undergrounding of electricity transmission lines shall be considered in the first, as part of a detailed consideration of an evaluation of all options available in delivering and providing this type of infrastructure. The development shall be in accordance with best international practice with regard to materials and technologies that will ensure a safe, reliable, economic and efficient and high quality network and mitigation measures will be provided where impacts are identified'*.

5.4.2.3. Meath County Development Plan 2013-2019

The plan refers to the undergrounding of local energy services such as electricity (EC POL 16 and EC POL 19).

5.4.3. Issues raised by observers during the course of the application and during the oral hearing

Various matters have been raised by the observers in relation to the consideration of alternatives by EirGrid. These relate primarily to transmission technology and route alternative and comprise:

- The failure to re-evaluate alternatives since the withdrawal of the previous application in 2009.
- The failure to consider other route options.
- The failure to consider alternatives such as uprating the existing interconnector, upgrading/constructing new generating plant in Northern Ireland to address deficiencies, or, to examine realistic combined options to achieve the same result.
- The failure to comprehensively consider the undergrounding/partial undergrounding option.
- The failure to apply the same consideration to the North-South Interconnector as applied to Grid Link and Grid West.
- The failure to consider issues regarding specific sections of the line route.
- The failure to consider support structures with less visual impact.
- The failure to comply with the provisions of the EIA Directive in relation to alternatives.
- The consideration of alternatives and designation of the project as PCI.
- The failure to conduct a proper comparative cost/benefit analysis of the proposed development and alternatives.
- Other matters.

The applicant's response to the issues is contained in Chapter 5 of EirGrid's submission to the Board of October 19th, 2015.

5.4.4. Oral Hearing

Alternatives were discussed in Module 1.6 (Consideration of Alternatives) on March 15th & 16th, 2016 (Day 5 & 6 of the hearing).

Submissions were made by the following observers in Part 1 of the hearing: -

- Mr Toirleach Gourley, Senior Executive Planner (Monaghan Co Council).
- Mr Nigel Hillis, Co Monaghan Anti-Pylon Committee (CMAPC).
- Mr David Hughes, on behalf of Ms Carmel Mc Cormack.
- Dr Padraig O' Reilly, North East Pylon Pressure Campaign (NEPPC).
- Mr Michael O'Donnell SC, on behalf of Ms Aimee Treacy (NEPPC).
- Mr Philip Connolly.
- Mr Kevin Traynor.

In attendance for EirGrid were: -

- Mr Des Cox, Senior Planning Consultant (EirGrid).
- Mr Mark Norton, Manager, Transmission Network Planning (EirGrid).
- Dr Norman Mac Leod, Technical Director HVDC, (PB Power).
- Mr Aidan Geoghegan, Project Manager (EirGrid).
- Mr Jarlath Fitzsimons (Senior Counsel).

5.4.5. Assessment

The following provides an assessment of the various issues raised in the submissions and during the oral hearing.

5.4.5.1. Failure of EirGrid to re-evaluate alternatives since the withdrawal of the previous application

It is contended by the observers that EirGrid should have commenced the process of the consideration of alternatives from the beginning and not merely started where the previous application left off. It is argued that the new project warrants a whole new scoping exercise and appraisal of the study area, the route corridors options, preferred route corridor and not a re-valuation of obsolete and discredited information. The observers questioned why reliance was being placed on

information, data and consultation from 2006 and 2007 on a project with such a long-term significant impact on the people of the area.

It was acknowledged by EirGrid that the new proposal must be based on up to date information. To this end, it undertook a re-evaluation of the original project, following the withdrawal of the previous application in June 2010. Its stated purpose was *'to ascertain whether the scope, content, conclusions, and the rationale for the proposed development remained relevant for the purpose of informing and shaping a new application for approval for the proposed North-South Interconnector development'.* Whilst it is correct to say that the study area and the route corridor remain largely similar to the previous proposal for the Meath-Tyrone 400 kV Interconnection Development, it is incorrect to suggest that this was accepted as a *fait accompli*.

The review process took place in a series of steps or phases between 2010-2012 resulting in the publication of two reports both of which were subject to public consultation. The first phase culminated in the publication of the Preliminary Re-evaluation Report in May 2011 (Appendix 1.1 Volume 3B Appendices). It consisted of a comprehensive re-evaluation of the previous application, the EIS and supporting documentation, written and oral submissions made to the Board in connection with the previous application and any new information that emerged since its withdrawal.

It re-affirmed the strategic need for the development and re-evaluated the study area and the rationale for same. One of the principal considerations determining the original study area was the need to connect to the most robust parts of the transmission systems north and south of the border. These connection points were identified jointly by the transmission system operators (SONI & EirGrid) as Woodlands sub-station in Co Meath and a planned new substation in Co. Tyrone. The review process revisited the principal assumptions and recommendations of the various studies previously prepared and concluded that no new environmental consideration or other relevant material had arisen in respect of the original

evaluation process, which identified the overall study area within which to locate the new interconnector.

Having established that the previously identified study area remained the most appropriate for the routing of the proposed interconnector, previously identified key environmental and other constraints were re-evaluated. New information was also considered including changes in relation to constraints such as new environmental designations, updated development plan designations, updated wintering bird surveys etc. Baseline data was updated and while minor variations between current and previous findings were identified as a result of the re-evaluation process, it was established that no new constraints information arose which would have material implications for, or, would otherwise prevent the identification of potential route corridors within which to site the development.

Once key environmental and other constraints were identified, the next stage in the process was the re-evaluation of the previously identified route corridor options. Addendum reports were prepared to compliment the earlier Route Constraint Reports, providing further analysis of the impacts of each route corridor on the key constraints. It was established that the updated constraints did not have material implications for the locations of the previously identified route corridor options. EirGrid were also satisfied that the process did not result in the emergence of any previously unidentified route corridor of equal or greater merit than those already identified in respect of the previous application.

Each corridor option was then evaluated against the identified constraints. The evaluation criteria were reviewed and updated having regard to the issues and concerns articulated through the public consultation process and during the oral hearing in respect of the previous application. The process resulted in the identification of the emerging preferred route corridor option i.e. Route Corridor Option A in the CMSA and Route Corridor 3B in the MSA. This route option was evaluated as having the lowest potential for creating long term adverse significant impacts which cannot be mitigated.

Phase I of the re-evaluation process concluded with the identification of a preliminary line route for the proposed interconnector within a preferred route corridor, which was considered a viable and environmentally acceptable preliminary indicative line route. The Preliminary Re-evaluation Report which resulted from the process was then subject to public consultation.

The second phase of the review process resulted in the Final Re-evaluation Report which was published in April 2013 (Appendix 1.2 Volume 3B Appendices). It took into consideration the feedback received through the consultation process associated with the Preliminary Re-evaluation report and important documents published in the interim, including the Independent Expert Commission Report (IEC) of January 2012, Grid 25 Implementation Programme 2011-2016, Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure (July 2012) and EirGrid's 'Project Development and Consultation Roadmap'.

This part of the re-evaluation continued along the same format as stage one. Constraints information was reviewed and updated and feedback from landowners, stakeholders and the general public fed into the process.

The robustness of the study area was confirmed, following a re-evaluation of the study areas, which including an additional area east of Navan and a straight line option at the request of the Board. No new significant environmental or other constraints were identified and it was concluded that the updated constraints did not have material implications for the previously identified route corridor options. No additional and/or previously unidentified route corridor emerged from the re-evaluation process that was considered of equal or greater merit to those identified route corridors that were considered in respect of the previous application.

The robustness of the original identified corridors in the context of the updated constraints and other information gathered since the original identification of these corridors in 2007 was confirmed. Following the evaluation of each corridor option

against a range of technical, environmental, community and other criteria, Route Corridor Option A in the CMSA and Route Corridor 3B in the MSA emerged as the overall preferred route corridor within which to route the proposed development. This route option was evaluated as having the lowest potential for creating long-term adverse significant impacts which could not be mitigated. The re-evaluation concluded with the identification of an indicative line route for the transmission line, which was then brought forward for public consultation.

Whilst the preferred route that emerged following the re-evaluation process (Route Corridor Option A and Route Corridor Option 3B) is broadly similar to the 2009 line route, it is not identical. It incorporates localised modifications to take account of the decision not to proceed with a new intermediate substation in the vicinity of Kingscourt in Co. Cavan and the construction of houses occurring since the preparation and submission of the previous application in December 2009.

Contrary to the suggestion made by the observers, it is clear from the preceding sections of the report that EirGrid did not seek to rely solely on the information presented in the previous application. Whilst it had the benefit of the previous planning process and had regard to the considerable body of work previously undertaken, it conducted a comprehensive re-evaluation of the information and particulars generated in respect of that planning process.

Much of the data contained in the EIS and associated studies remained relevant to the process of identifying and assessing the main effects which the new proposal is likely to have on the environment. The published reports document the review of the proposed interconnector previously proposed and sought to update all relevant information. This highly iterative process ensured that the public and other stakeholders had the opportunity to engage and feed into this process. EirGrid had regard to the issues raised at each stage of the re-evaluation process, all of which has informed the current application before the Board.

I accept that the re-evaluation process conducted by EirGrid is clear, unambiguous and comprehensive. Based on the information presented in the EIS and the supporting documentation, I consider that the Board can be satisfied

regarding the robustness of the study area, that alternative route options have been properly assessed and that the updated constraints do not have material implications for the previously identified route corridor options. I accept that EirGrid has justified the final line design as the optimum solution to meet the overall objectives of the development, having regard to strategic and environmental constraints.

5.4.5.2. Failure to consider other route options

During the oral hearing Mr Gourley (Monaghan Co Council) questioned why the alignment had to pass through Co Monaghan, and why there was not a more robust consideration of other alternatives such as the Eastern Study Area. In relation to Option 2A he questioned why an option of running another line in the general area, ‘*’but towards Armagh past Crossmaglen had not been considered with a different border crossing’ in South Armagh”*. This, he said, would offer scope for physical separation from the existing interconnector and any potential for simultaneous outages. He questioned why the alignment was routed to the west as opposed to the east of Option 4B, and why alternative border crossing points were not considered.

Mr D Cox (EirGrid) in his response to these matters noted that this is a project that has developed over a considerable period of time. He drew attention to the content of Chapter 5 Volume 3B of the EIS and how various interconnection and route options were examined, assessed and re-visited. This, he said, explained why the proposal was routed through Co Monaghan and the east coast was avoided.

The EIS documents in detail how the potential route corridors evolved and were assessed on the basis of environmental and other constraints. A comparative evaluation of each route option against key constraints was conducted. The preferred route corridor emerged following a detailed appraisal and was evaluated as having the lowest potential for creating long term adverse significant impacts which cannot be mitigated.

Option 2A –Eastern Study Area, for example, was not brought forward on the basis of significant constraints including high population density, widespread ribbon development, potential for impacts on Bru na Boinne, existence of designated sites and the cost of additional length etc. Option 2B, which involved the construction of a new Louth-Tandragee circuit to the east of the existing north-south interconnector, was rejected on the grounds of significant landscape and visual impact constraints due to its passage through the Ring of Gullion Area of Outstanding Natural Beauty. Mr Norton (EirGrid) also confirmed during the oral hearing that this option was rejected on the grounds of technically unacceptability. He noted that while a certain amount of separation could be achieved between the two lines, the problem arose in relation to the termination points where the run-in on either end of the lines would be in close proximity to the existing one. This would run the risk of both lines being brought down by similar conditions e.g. weather conditions or system failure within the substation.

Responding to the question why the interconnector was routed to the west as opposed to the east of Option 4B, Mr Norton noted the technical need to avoid crossing the existing interconnector and the potential for high probability of simultaneous failure. Mr Cox referred to the constraints mapping and the need to weave the line through the various built and environmental constraints to avoid urban areas, water bodies, designated areas and other environmental considerations. With regard to the border crossing, I note that this was considered to be the most appropriate option, established jointly be SONI and EirGrid, having regard to the need to connect at the strongest points on the respective transmission systems and the considerations of localised constraints and environmental considerations.

It is clear that the consideration and evaluation of the various route options is an involved process, which has taken place over a considerable period of time. It is too simplistic to assume that the line can be routed in a particular way, or, away from a particular area, without having due regard to the complexities that surround the evaluation process. The merits of each of the individual route corridors has been assessed in the EIS against a plethora of environmental, technical and other constraints. It is clear that there are environmental constraints associated with

each option and the aim of the evaluation process, is to find the most appropriate balance (or 'best fit') between the various technical, environmental and other evaluation criteria.

The geographic positioning of the development is influenced by the strategic need for the project i.e. to provide increased interconnection between the north and south of Ireland and to reinforce the north east, to connect into robust points on both transmission systems and the desire to seek the shortest environmentally and acceptable route between those connection points. The route alignment put forward for this application has been assessed against viable alternatives and found to be the most acceptable solution. It achieves the required separation between it and the existing interconnector and is considered to constitute the most appropriate balance between the evaluation criteria. The process has been conducted in an open and transparent manner and based on the information presented, I consider that the Board can be satisfied that the line route that has been brought forward is the best overall solution, which satisfies the requirements of the North-South Interconnector, while at the same time minimises the effects on the environment.

5.4.5.3. Failure of EirGrid to consider alternatives such as uprating the existing interconnector, upgrading/constructing new generating plant in Northern Ireland to address deficiencies or to examine realistic combined options to achieve the same result

It is the opinion of some of the observers that there are alternatives to building a new 400kV interconnector and these were not considered in the EIS. It is contended that such alternatives could include upgrading the existing interconnector, providing new generating plant in Northern Ireland/extending the life of existing plant/increased storage capacity, or, a combination of options to achieve the desired capacity and security of supply objectives for the North-South Interconnector.

Dr P O' Reilly (NEPPC) in his submission to the oral hearing, referred to the failure of EirGrid to consider the use of new technologies or combinations of these, such

as High Tension Low Sag technology (HTLS), series compensation, gas insulated lines and ARGO technology. He noted that there has been no real examination of changes in the market place that have occurred, which would facilitate some of these other options. It was his contention that the Board should refuse this application and that the Government should establish an independent expert group to find a practical and acceptable solution, such as a combination of the various technologies that have come along in the last two years.

I draw the attention of the Board to Chapter 4 of the EIS (Volume 3B) which outlines the main transmission and technology alternatives considered by EirGrid. Contrary to the assertions made by the observers, alternatives to transmission network solutions, such as providing new generating plant/ extending the life of existing generating plant in Northern Ireland and increased dependence on renewable energy are discussed as potential alternatives for addressing the emerging shortfall in generating capacity north of the border. I note that the alternative of reinforcing the existing line to increase power transfer capacity was not specifically referred to in Chapter 4, presumably on the grounds that it was not perceived as a viable alternative, on the grounds that it would not address the fundamental issue of system separation.

The limitations associated with the existing interconnector together with the imminent shortage of power generating capacity and the consequences for Northern Ireland are well documented in the EIS. The Louth Tandragee 275 kV is the only effective large-scale interconnection that exists between the two jurisdictions. As outlined in earlier sections of this report, the technical need for the development arises as both circuits are supported on the same set of structures, which creates the potential for system separation. Such an event would have consequences for the networks in both jurisdictions and cause a risk to security of supply.

The various options referred to by the observers are considered in more detail below.

Reinforcing existing line

The observers contend that the issue of power transfer could be addressed by reinforcement of the existing line. Mr Norton (EirGrid) addressed this issue during the oral hearing. He acknowledged that technologies such as the use of High Temperature Low Sag (HTLS) conductors or installing 'series compensation' are ways of using existing capacity on a circuit to obtain greater power transfer. Similarly, 'ARGO' is a way of carrying out a voltage uprate on an existing asset to give a higher capacity circuit. However, none of these options resolves the identified issue of system separation and the technical need for an additional interconnector.

The use of gas-insulated lines was ruled out by the Independent Expert Commission (IEC) and EirGrid themselves. It is a new and emerging technology that has not been tried or tested on distances comparable to the proposed project. Similarly, microwave links, using no wires at all is a highly experimental and theoretical approach, which to the best of EirGrid's knowledge has never been put into service on a transmission system.

New generating plant/extending the life of existing plant in Northern Ireland

The observers expressed concerns that the proposed development is required to address emerging deficiencies in electricity generation capacity in Northern Ireland and that consideration should have been given to resolving this issue north of the border. It is suggested that the identified deficiencies could be resolved by building new generation plant or by extending the life of existing plant.

At present there are four electricity generating plants in Northern Ireland. The generating capacity of two of these plants going forward (Ballylumfort and Kilroot) will cease or be severely restricted due to environmental constraints imposed by EU emissions directives. The ability of Northern Ireland to meet its electricity demand is expected to come under increasing pressure from the start of 2020 onwards. South of the border there is a surplus of generating supply but due to the

capacity limitation imposed on the existing interconnector, the power cannot be transferred to alleviate security of supply issues north of the border.

Whilst developing new generating plant/prolonging the life of existing plant would address future security of supply issues in Northern Ireland, it would not address the transmission constraints that currently exists between Ireland and Northern Ireland.
The proposed interconnector will provide a separate power flow independent of the existing connector and significantly reduce the potential for system separation. It will operate in parallel with the existing and will more than double the power transfer capacity that can flow between the two transmission systems (1100 MW). It will remove existing restrictions that limit cross border flows between Ireland and Northern Ireland and provide long term capacity and security of supply improving the efficiency of the all-island electricity market.

It has been demonstrated that while the use of alternative technologies such as conductor replacement or new power flow management devices to reinforce the existing interconnector may facilitate increase power transfer between the two jurisdictions, there would remain only one high capacity line connecting the North and South of Ireland. This would not resolve the risk of system separation and is not, therefore, a viable alternative to address the identified need for the project. Similarly, the provision of new generating plant or upgrading of existing plant north of the border does not address transmission constraints across the border or the integration of the electricity systems. I accept that it has been comprehensively demonstrated that the only way to meet the strategic and technical need for the proposed development is to provide with a new and physically separate high capacity interconnector.

5.4.5.4. Failure of EirGrid to comprehensively consider the undergrounding option or partial undergrounding.

It is the opinion of many of the observers that EirGrid is prejudiced against the undergrounding option and has failed to consider it as a realistic alternative. It is widely considered that the overhead line (OHL) is the most objectionable form of infrastructure and that EirGrid's preferred solution needs public acceptance to be successful.

Mr N Hillis (CMAPC) is his submission to the oral hearing stated that when the decision was made to proceed with the North-South Interconnector, there is no evidence that any alternative to an overhead line was considered. He documented various reports and the absence of any proper consideration of the underground option throughout that period up until the Independent Expert Commission Report (IEC) in 2012. This report acknowledged that the underground option using VSC HVDC was technically feasible and that developments in technology were advancing rapidly.

Dr O'Reilly (NEPPC) stated that EirGrid exaggerated the negativity around the feasibility of undergrounding. He argued that a combination of the existing overhead line with an underground system is a much better compliment in terms of security of supply and system separation than putting up an additional overhead line. He also questioned if the combination of the HVDC undersea and underground cable for the East West Interconnector from Wales to Woodlands is reliable and successful, why it is not being considered for the current proposal.

Mr Kevin Traynor (observer) also challenged EirGrid's assertions that the undergrounding of the project is not a valid option. It was his contention that some of EirGrid's justifications for the lack of feasibility of undergrounding is based on the use of an AC connector and the limitations of this technology are well documented. He stated that the justification for not considering the DC option as a potential solution is not based on the most up to date technology available. The conclusions made by EirGrid regarding deficits in DC transmission technology capability were based on information that was reported in 2008. Even the updated

PB Power Technology and Costs Report in 2013, does not recognise the advances in technology in converter stations for HVDC.

During the oral hearing reference was also made to advances in technology and experiences in other countries, stated to have been ignored by EirGrid. Questions were also raised regarding EirGrid's failure to examine feasible underground options such as routing the cable along the M3, the disused railway line and the local road network.

Alternative transmission technologies

Having established that non-transmission solutions (as discussed above) would not address the strategic and technical requirements of the development, various alternative transmission technologies were examined by EirGrid. These included the use of AC and DC technologies and overground and underground options, including partial undergrounding of the circuit. EirGrid was informed by a number of reports commissioned jointly by the respective applicants to examine the technology alternatives available for the proposed development. It also had regard to other third party reports (Table 4.2 - 4.4 of Volume 3B), including those commissioned by the Government.

Undergrounding using an AC cable

Undergrounding the interconnector using an AC cable option was eliminated as an alternative on the grounds that it would not be in accordance with good utility practice. This view was supported by the Independent Expert Commission (IEC) who in the specially commissioned report by the Government (Meath-Tyrone Report Review–November 2011) recommended against fully undergrounding the proposed interconnector using an AC cable solution. It acknowledged that the AC underground option is only considered for shorter distances (10-20km) and has not been applied for any similar projects in Europe.

Undergrounding using a DC cable

EirGrid revisited the issue of DC underground option as an alternative technology following the withdrawal of the previous application. It considered reports published in the intervening period including the IEC Report in January 2012 and noted its findings. Other than recommending against fully undergrounding using AC cables, the IEC did not recommend any solution, noting that there was no 'right' solution and that 'each individual project must be judged on its merits'. It did conclude that if the interconnector was to be underground in whole or in part, then with current technology (2012) the best solution was a VSC HVDC solution combined with XLPE cables.

EirGrid acknowledged the IEC Report findings and as part of the re-evaluation process conducted a comparative assessment of a VSC HDVC circuit versus a standard high voltage AC overhead line circuit for the implementation of the development against the previously identified project objectives/design criteria. The main difficulties identified were the inability of a DC circuit to integrate seamlessly into the existing meshed AC system, difficulties associated with future grid connections/reinforcements and excessive cost. It concluded that the DC option would be significantly more expensive and technically inferior to a standard AC solution. Furthermore, EirGrid did not accept that the installation a DC circuit over the length of the proposed interconnector would be in accordance with good utility practice, noting that there were no comparable examples in Europe. It concluded that the DC option, even one using the latest VSC HVDC is not an acceptable option for the specific nature, extent and intended function of the proposed development and it was on this basis that EirGrid brought forward a standard AC OHL solution.

During the oral hearing both Mr Norton (EirGrid) and Mr Geoghegan (EirGrid) responded to the submissions, refuting any suggestion that EirGrid had not fully assessed the underground option. Mr Norton drew the attention of the hearing to Chapter 4 Volume 3B, where he said the various options were evaluated. He referred to Table 4.6 of the same chapter that provides details of the multi-criteria

analysis, which demonstrates why AC is the preferred solution. He noted that while both options are comparable in terms of safety, the ability to deliver 1500 MW capacity, reinforcement of the north-east etc., the DC option is weaker in terms of reliability and security, the ability to facilitate future grid connections/reinforcements and cost.

Mr Norton stressed that reliability and security of supply is a major consideration in terms of achieving the benefits of the single electricity market, renewable energy integration etc. He noted that all the networks around the world are built as alternating current and there is no need to convert power from alternating to direct current as a result. He explained that an AC line that is connected into an AC network would work seamlessly. The situation is different if a DC line is embedded into an AC network because complex control systems need to be in place to make it operate like an AC circuit. In terms of cost, he noted the IEC and PB Power reports, both of which accept that the cost of DC would be multiples of an AC solution. The conclusion reached by EirGrid is that AC is a more cost effective and technically preferable solution.

European experience

The observers do not accept the position adopted by EirGrid and reference was made during the oral hearing to examples across Europe where significant distances of underground cabling using the DC option is being used or is proposed. According to Mr Traynor (observer), these projects use state of the art converter technology to convert AC into DC and vice versa. It was his opinion that many of the technology problems that EirGrid have documented regarding an underground solution, could be answered at least in part, by the employment of new technologies similar to those employed across Europe.

In terms of compliance with good utility practice or good international practice, EirGrid stated during the oral hearing that there are no comparable working examples in the world of a DC circuit embedded in a small and isolated AC transmission system, such as that on the island of Ireland. Examples of interconnectors in Europe such as the France-Spain and Norway-Sweden

Interconnectors are noted but are not considered to be comparable. It was note by EirGrid that these countries are already highly interconnected and the in contrast to the North-South Interconnector, which will form an extension of the backbone of the all-island transmission network, these interconnectors are not of comparable strategic importance and are less critical to the overall system security of their combined networks.

In response to the submissions made during the oral hearing, Mr Norton (EirGrid) stated that he did not consider that comparisons could be drawn between the proposed development and the examples cited across Europe. These projects were required for different purposes such as improving access to renewable energy and to facilitate sharing between countries. He noted that the stakes were much higher in the case of the proposed development, where there is only one interconnector and the risk of failure, and the consequence of failure is an important factor in deciding whether embedding a DC circuit in an interconnected circuit is, or is not, good international practice.

I draw the attention of the Board to the IEC Report 2012, which looks at benchmark projects in Europe to show how other projects have used technical developments to deal with societal pressure. It notes many examples across Europe where VSC HVDC technology has been applied. In all of the examples, the projects are situated in a meshed grid and are driven by the same drivers as the proposed development including secure grid operation, coupling of markets and enabling of deployment of renewable energy resources.

The France-Spain interconnector (320 kV), for example, is routed across the Pyrenees creating a 65 km long underground transmission system, which doubles the electrical power exchange between the two countries from 1400 MW to 2800 MW. It takes advantage of existing infrastructure corridors such as motorway and high speed train routes. Part is constructed within a tunnel and the remainder is built in underground trenches. It uses Voltage Source Converter (VSC) technology, a technology with the capacity to quickly convert alternating current to direct current. The project began commercial operation in October 2015.

The South-West Link Project in Sweden/Norway is also documented. It was to be developed in three parts using a combination of 400 kV AC OHL, 320 kV DC UG cables and 320 kV OHL solutions. The report documents the reason for the choice of technology on parts of the route. Whilst the cost for a VSC HVDC option was estimated to be 25% more expensive that an AC option for one part, it was considered that from an operational point of view the HVDC offers benefit in terms of possibility to control active and reactive power (allows control of power and voltages), which gives more support to the connected AC grid. On the downside VSC technology was considered to be a less mature and more complex technology, that could lead to increased operational costs.

Reference was also made during the oral hearing to the France-Italy interconnector, which I note is currently under construction. It is 190km long crossing the Alps with a 320kV DC underground cabling system and a capacity of 1200 MW. It will run completely underground, integrated with existing roads and motorway infrastructure. When it goes into service it will be the longest sub-terranean high voltage power line of its type. It is required to ease congestion on the existing line and will play a strategic role in increasing security of supply and enabling power exchange between Italy and France.

What has emerged is that there are significant advances in the use of DC underground technology over the past number of years, with longer lengths of cable and higher power ratings being installed across Europe. In more recent years, advances in HVDC technology, particularly VSC HVDC, has stimulated many European projects to use this technology to address public concerns regarding landscape any other environmental considerations. In other situations, the technology was chosen for operational reasons. It would also appear that with advancements in converter stations, the use of transistors to control active and reactive power at AC terminals (i.e. for the AC grid, the DC connection can provide all functions delivered by an AC overhead line equipped with flow control devises) and the development of DC breakers (which allows for increased flexibility for construction of DC grids), the VSC HVDS is indeed a more viable alternative than previously envisaged.

I accept that different projects require different solutions. EirGrid accepts that the DC option is feasible, but rejects it on the grounds of technical and cost considerations. Having regard to the significant technological advances made and which continue to be made in technology, the Board may wish to seek specific expert opinion on the current feasibility of integrating a HVDC system into the existing AC meshed network. However, having taken into considerations all of the arguments made, the strategic importance of the proposed interconnector as part of the all-island transmission network, the lack of existing strong interconnection between Ireland and Northern Ireland and the overwhelming need for reliability and security of supply, on balance it would appear that the technology currently best suited to satisfy the requirements of the proposed North-South Interconnector development is an overhead high voltage alternating current power line.

Undergrounding under local road network

There was considerable debate during the oral hearing regarding the potential to route a DC cable along the local road network. It is contended that it is possible to install a DC cable in a trench of limited depth and width, which would enable it to be accommodated in the local road network. Reference was made to the Briefing Note from Europacable (Submission No 3), submitted to the Inspector during the oral hearing. The observers took issue with EirGrid's claim that a 22m wide strip is required when the cable industry claim that the installation is possible along public roads in a smaller trench within a very short depth and width.

Mr Hillis (CMAPC) made specific reference to the Grid West project, noting that roads were identified to underground a cable between Moygownagh in Co. Mayo to the substation at Flagford. He noted that this alternative was clearly identified by the IEC, but was never developed as a realistic alternative by EirGrid for this project. Mr Hillis also referred to the report entitled *'Grid West Project Underground Route Options Preliminary Evaluation Report'* July 2014, which acknowledges that *'in general it is preferred to route underground high voltage*

cables along public roads to allow ease of access for monitoring and maintenance of the cables'.

Responding on behalf of EirGrid, Dr. Mac Leod clarified that the 22m strip across farmland referred to in the EIS related to an AC underground solution. He acknowledged that DC cables can fit into a narrower trench but that it would not be possible to accommodate a 1500 MW development into a single trench. This, he said would be extremely dangerous, as each cable must be electrically isolated and separated for thermal and security reasons. Whilst the East-West Interconnector, for example, comprises two cables in a single trench, it has a rating of 500 MW.

Commenting on the Europacable document, Dr. Mac Leod noted that it does not show the concept of having two electrical cables in a narrow trench. He stated that there are two things that must be considered when putting high powered cables underground. One is thermal condition and the other is access for repair. There must be sufficient separation distance between the cables to allow them to cool by expelling heat into the surrounding soil and sufficient space to allow for repairs. He could not envisage how a repair could be carried out with four cables in a single trench. The only way to conduct repairs in do repairs would be to de-energise all circuits. This would mean that 1500 MW would be lost for the time of the repair, which could take several weeks.

Dr. Mac Leod stated that for a project of the level of importance of the north-south interconnector, where reliability is fundamental, a bipole arrangement would be required, requiring two sets of cables. Such a scheme would require two trenches each at least 1m wide with a separation distance of up to 4m between the trenches. It would also be necessary to maintain a setback (2m) from vegetation to prevent roots interfering with the cables. He stated that a swath of at least 8-10m would be required and during construction a significantly wider width would be necessary to accommodate vehicles, spoil heap etc.

Mr A Geoghegan (EirGrid) noted that the option of routing the line underneath the local road network was examined by PB Power and it was indicated quite clearly

(Page 73 of PB Power Report 2009) that the public roads in the region were not wide enough to accommodate this construction. To accommodate the trenches on either side of the local road network would require a substantial soft margin on each side and there is no such road in the area. He also highlighted the difficulties associated with the repair of faults, noting that an extensive process would be involved, requiring the erection of a building to create clean conditions around the joint.

Mr Geoghegan also drew the attention of the hearing to Figure 2 of the Addendum Report of 14th June 2014, submitted by EirGrid to the IEP. It comprises a series of photographs, which shows repair work to the Moyle cable which connects between Northern Ireland and Scotland. It consists of two separate cables and each cable can operate independently of the other. He noted that the excavation is extensive but that the second cable is not visible. He stated that it is strategically important to keep clear separation distances between the two individual cables so that damage to one or a single event would not damage both. The separation distance guarantees safety, allowing repair work to be carried out without interfering with the second cable. He re-affirmed his position that two electrical cables need two trenches separated by reasonable distance for repairs and thermal reasons and this was not possible along the local road network in the area.

Responding to questions from the Inspector on whether it would be technically possible to separate the trenches into two different roads, Mr Mac Leod confirmed that while it would be technically possible it would not be desirable. It would effectively involve building out two separate schemes. Mr Norton confirmed that future connections would be very difficult and that it would be difficult to make use of full capacity because the schemes would be separate. There would also be twice the scale of investment, twice the scale of works and rebuilding twice the amount of roads.

It was confirmed by EirGrid that whilst routing the underground cable underneath the local road network was considered, it was not developed as a main alternative

or developed further because it was not considerable tenable from a system operator's point of view. Mr Geoghegan noted the winding nature of the roads in the region and that this option would significantly extend the length of the development. He stated that a cross country route is the shortest possible route, a far more efficient way of developing the scheme than developing in the road network. It is for that reason that it did not become one of the main alternatives.

To conclude, I would point out to the Board that there is a difference of opinion on the width of the trench required for a HVDC cable, which would have a bearing on the type of road that could be used to underground a cable. I consider that it has been demonstrated that due to technical and operational considerations, the local road network in the vicinity of the development would not be suitable to accommodate the underground option. I note that the IEC Report 2012 accepted that if the option is to underground, the best cable route is *'most likely following existing infrastructure such as large freeways or railroads or through farmland'*. These options are discussed below.

Other underground options

During the course of the oral hearing, Mr Norton noted that the disused railway line was considered and eliminated on the basis that as a single track railway, it was simply too narrow. I note that locating an underground cable within the reserve of the M3 motorway was discussed with the NRA (now TII), who advised that it would only be permitted if EirGrid agreed to indemnities regarding damage, disruption, cost etc. acceptable to both the NRA and the public/private partnership company that would operate the road were received. EirGrid concluded that this requirement introduced such complexity, uncertainty and risk that it would render the route a less favourable option that a direct cross country route, which appears reasonable. Mr Geoghegan (EirGrid) also referred to the photographs showing the repair of the DC underground Moyle Interconnector cable, stating that it was clear why the TII would not want an underground cable in the M3 motorway.

I note that these options were presented in EirGrid's Report to Independent Expert Panel Addendum dated June 19th, 2014. (Appendix 3 Volume 2A Appendices) and no issues were raised by the IEP.

I accept that there may be significant constraints associated with placing the interconnector in the hard shoulder of the M3 motorway, including the repair of faults, future upgrades of the motorway, indemnities etc., which would make it less attractive as an alternative.

Partial undergrounding

Some of the observers have questioned why partial undergrounding, which is now being considered as part of Grid West and Grid Link, has not been applied to the proposed interconnector.

Partial undergrounding of shorts lengths of the transmission line was considered (Section 4.7.3 of Volume 3B of the EIS), but only in the context of using HVAC technology, as HVDC had already been eliminated as a viable option for the proposed development, for the reasons already discussed. The HVAC solution has been discounted on environmental, technical and cost considerations.

Environmental issues include the wide construction corridors required that would cut through the countryside (20-22m), considerable disruption to farming activity, permanent gaps in hedgerows and the provision of transition stations (resembling a small sub-station) at every location where the circuit changes from OHL to UGC. Technical considerations include the risk to transmission system stability associated with installation of a section of UGC into an OHL circuit, which is considered to be a suboptimal solution. Finally, it was concluded that the cost of undergrounding is considerably more expensive that the OHL option. Two transition station are required at either end of the circuit that is undergrounded which is estimated could add an additional € 5-15m (approximately) per installation.

The IEC Report 2012 concluded that partial undergrounding remained an option for consideration, was technically feasible but within limitations on the cumulative length of the underground cable section. EirGrid accepted that a hybrid solution was feasible but only if the length to be undergrounded in restricted (less than c 10km) and the cost can be proven to be an environmentally advantageous and cost effective way of overcoming an otherwise unavoidable environmental or technical constraint to the preferred OHL.

I draw the attention of the Board to the Partial Undergrounding Report (Appendix 5.1 Volume 3B Appendices). It was produced in response to a request from the Board that the EIS should consider partial undergrounding where potential significant impact on landscape/demesne landscapes were identified. However, no section of the route was identified where it was considered that partial undergrounding was warranted to mitigate such impacts. The option was discounted on the basis of environmental and cost grounds, which is considered reasonable and considered in more detail in other sections of the report (i.e. Landscape).

System availability

During the oral hearing questions were raised regarding the probability of faults on the overhead line versus an underground cable. Mr Norton (EirGrid) referred to International Studies Technical Brochure 379 which shows that the kind of availability rates of underground cables is much poorer than for overhead lines. He noted that while overhead lines are susceptible to weather, they have less intrinsic faults.

Mr Geoghegan (EirGrid) drew the attention of the hearing to the repair times associated with faults on the different transmission systems. If a permanent fault occurs on an overhead line, it could typically be repaired in less than two days. International statistics show that it would take on average 25 days to repair a high voltage underground cable. He said that the factor that impacts most on system availability is not necessarily finding, but repairing the fault. He confirmed that he was not aware of any faults occurring on the East-West Interconnector since it

was constructed. He did note, however, that the Moyle Interconnector between Scotland and N. Ireland had experienced severe problems with cable faults and significant repair time.

Mr Traynor (observer) commented on technological advancements and that system reliability could be improved using modern underground HVDC systems, converter technology, power transistors etc., which offer superior performance characteristics and provide a high level of stability in the transmission system.

From the information presented it is clear that when a fault occurs on OHL, it is quicker to locate and repair than an underground cable. However, with advancements being made both in the development and use of underground cable technology, it would appear that going forward, faults will become easier to locate and repair.

Technical Advances-Expert Opinion

EirGrid's own re-evaluation of the proposal reached the conclusion that no new information had come to its attention that would alter its opinion that a 400kV AC OHL is the best technical solution for the development. The observers argue that underground cable technology has a proven reliability record, is a technology that is advancing fast and is being deployed extensively in other countries, and that there have been progressive reductions in costs.

During the oral hearing issues were raised regarding technical advances that have been made in the four years since the IEC report and that the Board may need expert opinion in this area. Mr Hillis (CMAPC) noted the IEC's comment '*In two years' time with the rapid advance in technology, our report could be different*'. Many of the observers are of the opinion that the Board should engage independent expert opinion

It has already been demonstrated that that there are feasible alternatives to an overhead line such as VSC HVDC. It has also been demonstrated that there are

rapid advances in the technology, and that it is receiving more widespread application and being run over longer distances and at higher power ratings. Whilst, the Board may wish to consider obtaining expert opinion on technology options, it is my opinion that as a critical element of the transmission system between Ireland and Northern Ireland, it has been demonstrated that an overhead line option presents less risk for system security, reliability and availability than a DC option.

5.4.5.5. Failure of EirGrid to apply the same consideration to the North-South Interconnector as applied to Grid Link and Grid West,

The public perception of this process is that EirGrid's re-evaluation of technology options in the case of Grid Link and Grid West has resulted in lower voltage, and or potentially more environmentally acceptable solutions, which could equally apply to the proposed interconnector.

In response to the issues raised Mr Norton (EirGrid) explained that it is the identified need for the respective projects which determines the solutions proposed. Grid West and Grid Link are fundamentally different to the proposed project. GridWest is driven by the connection of new generation in Mayo and as a direct result is effectively a conduit to transmit electricity into the meshed system. Existing infrastructure requires substantial investment to capture the increasing levels of renewable energy generation and transfer it to the rest of the country.

The initial conclusion was that a 400 kV high voltage AC OHL was needed for Grid West. In 2014 following public feedback, EirGrid accepted that underground options were ruled out too soon. These were re-assessed to see how they could meet the needs of the project and how they performed in environmental, economic and technical terms. EirGrid also investigated if a lower voltage solution could meet the capacity needs of the project.

Three options are identified for the delivery of the project including a fully underground DC cable, a 400kV OHL and a 220 kV OHL with partial use of underground cable (max of 30km). The final decision on the preferred technology

has still to be made. The project will initially connect up to 500MW of generation and the circuit only needs to be rated for that power. This permits a wider selection of transmission voltages (220 and 400 kV) and a capacity that can only be delivered through one cable only. Therefore, the options include not only 220 kV OHL's but a partial underground solution installed in roadways.

The Grid Link project was launched in 2012 and was a response to identified electricity transmission needs in the south and south east of the country. It was initially intended that the proposal would be a 400 kV HVAC OHL. By 2015, EirGrid were in a position to reconsider its technical options to meet the needs of the project, arising due to slower rate of growth affecting demand for electricity and developments in transmission technology. Three options were put forward including a 400 kV OHL, a HVDC UGC, and a 'Regional Option'. The latter, is a suite of transmission network reinforcements based mainly on the existing 400 kV network includes 'series compensation', an underground cable across the Shannon Estuary and some upgrade works to existing transmission lines. With Grid Link, it has been determined that the best option is 'series compensation' to make better use of the existing circuits.

I accept that both Grid Link and Grid West projects have different needs, which allow different solutions. As noted above the North-South Interconnector is proposed to meet different and very specific requirements. Having regard to the discussion on these matters, I would accept that the technical solutions put forward in respect of Grid Link and Grid West are not appropriate for the proposed development.

5.4.5.6. <u>Failure of EirGrid to consider issues regarding specific sections of the line route.</u>

Some of the observers queried why sections of the line adopted specific routes and why straight line trajectories were not observed. Monaghan County Council specifically raised concerns in respect to a number of tower locations, questioning why they are located on either elevated drumlin topography, exposed positions or close to scenic landscapes/landscape features.

The applicant's written response to the submissions clarified how local sections of the route were adopted. With the assistance of aerial photography and constraints mapping. During the oral hearing, EirGrid expanded on these matters showing how particular sections of the alignment were routed to avoid constraints both natural (ecological, landscape, water, geology) and man-made (for example one off houses, settlements, cultural heritage, infrastructure and utilities). All of the routes appear to be well grounded on constraint avoidance and minimising the potential impacts on residential property, the landscape and environment generally (discussed further under Landscape).

5.4.5.7. Failure of EirGrid to consider support structures with less visual impact

The observers raise issues regarding the design of the towers to support the overhead line. Mr M O' Donnell SC criticised the manner in which the monopole alternative was rejected. He did not concur with the conclusions reached regarding visual impacts when compared to the steel lattice structures proposed.

I note from the EIS that in considering alternative designs for the proposed overhead line, the applicants commissioned various studies, which investigated a range of issues from visual impacts on the landscape to electrical considerations. These studies are summarised in *EirGrid/NIE Meath-Tyrone 400 k V Interconnection Development*: *Tower Outline Evaluation and Selection Report* (October 2009), a copy of which is included in Volume 3B (Reference Material - Folder 2 of 6). The evaluation was confined to four steel lattice tower options only. Based on the visual assessment (conducted by AECOM landscape architects) it was concluded that the IVI Configuration imposes least on the landscape and was therefore the preferred option.

Separately, EirGrid also commissioned Atkins consultants to develop a conceptual 400 kV and 110 kV steel monopole designs. Atkins identified a conceptual design for a single circuit 400 kV steel monopole (Fig 4.16 Volume 3B) that is potentially suitable for the Irish transmission system. Following the re-evaluation process and the Independent Expert Commissions (IEC) comments that *'an AC OHL could be*

made more attractive by investing slightly more in new tower designs than the classical steel structures', EirGrid requested ESBI to carry out a comparative assessment of the monopole design versus the IVI tower specifically for use on this proposed development.

ESBI concluded that the monopole was technically feasible and suitable for use for the proposed development. It noted the advantages that would accrue in an urban or semi urban context but concluded that it was not clear that the Aitkin's monopole design would provide any advantage over that of an IVI steel lattice tower design in a rural landscape.

Responding to questions during the oral hearing, Mr Schultz (EirGrid) confirmed that the base of the monopole could be up to 6m in diameter and coupled with the additional number of structures required (up to 25%) would render the support structures more intrusive in the landscape. It was his opinion that the monopole would appear as a solid mass while the steel lattice would be transparent, allowing it to blend in more readily with the landscape, which is considered reasonable. The impact of the IVI Towers is discussed in more detail under Landscape.

I would draw the attention of the Board to the IEC Report 2012 (Pg 18), which states

> *'Many European projects, encounter a lot of public opposition and the delays due to this opposition are massive. When looking at all the projects finalised or designed during the last decade in Europe, it becomes clear that for 'green field' projects, i.e. connecting two nodes that were not connected before in the 400 kV grid, few have been built by using standard steel high voltage towers with standard conductors'.*

The report notes the technical developments in recent years i.e. such as replacing lattice steel towers with more compact designs. It notes that *'the*

> *design of the overhead line is very basic, with no attempt to use more advanced techniques to tackle some of the problems that are mentioned when dealing with overhead lines…such as visual impact'.*

I accept that EirGrid has considered various alternative support structures including steel lattice structures and monopole designs. Notwithstanding the IEC's comments, EirGrid has concluded that the IVI steel lattice tower is visually the most acceptable alternative and this is the structure that is brought forward for Board's consideration.

5.4.5.8. Failure to comply with the provisions of the EIA Directive.

Mr M O'Donnell SC in his submission to the oral hearing referred to the statutory provisions of the EIA Directive. He expressed concerns that the section of the EIS dealing was alternatives was undertaken jointly by EirGrid and SONI, which he contended does not provide an independent objective analysis of the alternatives available. He argued that this section of the EIS is skewed to present the perspective of the developer and is in fact a promotional document, which cannot be accepted to be in compliance with the Directive. He further argued that it does not comply with what the Board required in its direction, and it needs to be redrafted, independently prepared and analysed in accordance with the statutory scheme.

In his rebuttal Mr Fitzsimons SC noted the precise wording of Article 5.3 of the Directive which he said is not difficult to interpret and the requirements are self-evident. It requires that an *outline* of the main alternatives considered by the *developer* be undertaken. This, he said, makes it entirely appropriate for the developer to prepare this section of the EIS, as it is the developer who is required to identify the main alternatives considered pursuant to the Directive.

I would point out to the Board that Mr O 'Donnell in his submission on the question of alternatives repeatedly referred to the Non-Technical Summary (NTS) of the EIS. He did not at any stage refer to those chapters within the EIS, which deal with the question of alternatives. The Board will be aware that the purpose of the NTS is to provide a summary of the information contained in the EIS in a non-technical language to provide the public with an overview of the proposal. It is not designed or intended to provide all the detail contained in the EIS.

I draw the attention of the Board to the information contained in Chapter 4 and Chapter 5 of Volume 3B, which I consider provides clear and unambiguous information on both transmission/technology alternatives and the route alternatives considered by the applicant. It is in my opinion sufficient to ensure compliance with the provisions of the Directive.

5.4.5.9. Consideration of alternatives and PCI designation

Commenting on Mr O'Donnell's suggestion that it was impossible to reconcile the PCI designation of the project with the consideration of alternatives, Mr Fitzsimons referred to Article 7.1 of EU Regulation 347/2013. He noted that while the Union List establishes the necessity of these projects from an energy perspective, this is without prejudice to the exact location, routing and technology of such projects. In order words, the Board must assess the proposed location, routing, technology of the proposed project. As part of that assessment, EirGrid has set out the options it considered and the main reasons for its choice including environmental considerations as required under the EIA Directive.

5.4.5.10. Failure of EirGrid to conduct a proper cost/benefit analysis of the proposed development

The underground option is rejected by EirGrid on technical grounds but also on cost. The observers take issue with the lack of a cost benefit analysis for the various alternatives.

Dr O Reilly (NEPPC) in his submission to the oral hearing stated that the cost of undergrounding versus overhead lines had reduced significantly from 25 times in 2007 to 1.5 times as stated in EirGrid's most recent document '*Your grid, your views your tomorrow'.* He noted that the capital cost of the East West Interconnector worked out at € 2.3m per/km and the estimate for the overhead line is €2m per kilometre, which is very similar. Dr O Reilly also stated that while the capital costs associated with the overhead line is higher than the underground option, there is a need to build in the realistic costs of the overhead line such as

property values etc. When other factors such as delays etc. are factored in the underground option is much cheaper in terms of real life impact costs.

Mr Geoghegan, responding on behalf of EirGrid, noted that when the IEC published their report in 2012, they reviewed the PB Power Report of 2009 (Volume 3B Reference Material). They concluded that its results were correct and it analysis was robust, but that the report needed to be updated to take into account recent technological developments. As a result, PB Power updated their report and this was published in 2012. A supplementary note was published in 2013, which considered the cost implications in light of EirGrid's decision to defer the intermediate substation at Kingscourt.

The updated supplementary report (2013) provides comparative cost estimates for a 400 kV AC overhead line and underground cable and for a high voltage direct current (HVDC) voltage sourced converted (VSC) underground cable option. It notes that the deferment of the intermediate substation near Kingscourt would have a significant impact on the initial investment regardless of which technology option is chosen. It concluded that the most cost effective technology option is the AC overhead line. The cost update report estimates the difference in cost between the two options. It includes whole-of-life cost estimates such as planning and constructing the equipment, the cost of running it throughout its life, converter station costs etc. The cost update report does not purport to include costs, focussing on those which are comparable and that are quantifiable in the economic sense.

Mr Geoghegan (EirGrid) stated that the cost estimate for the AC overhead line is €140 million. The cost of an underground AC line is €880 million. The cost of an underground HVDC cable, the newest technology, is €810 million, €670 million more than the AC option. This means that the cost of undergrounding is a multiple of 5.7 when compared to the cost of an overhead line. The reference by Dr. O'Reilly to a multiple of 1.5 is in the context of Grid Link and is not comparable to the current proposal.

From the evidence presented, it would appear that an overhead line option remains the cheapest solution but that the cost of undergrounding is reducing. Ultimately, the cost effectiveness of the project is not a matter for consideration by the Board.

5.4.5.11. Other matters

Mr David Hughes (Secretary of the Passive House Association of Ireland and member of the National Scientific Committee for Energy and Sustainability which is part of ICOMOS Ireland), speaking on behalf of Carmel Mc Cormack, stated that the Board needed to take the bigger picture into consideration in terms of Ireland's overall energy policy and how it moves forward. He noted Ireland's vulnerable position and its dependency on energy imports.

He argued that increasing energy generation is not the answer and emphasised the need to reduce demand. One way of achieving this was to retro-fit building stock. This he said would be a viable alternative to help the country reduce energy demand, greenhouse gas emissions and fuel poverty. He questioned the need projects like the north-south interconnector if we reduce demand.

These are policy matters which are clearly beyond the scope of the Board and are decided at Government level. The Board can only adjudicate on the application that lies is before it having regard to European and National energy policy.

5.4.6. Conclusion

I accept, following the comprehensive re-evaluation process undertaken by the applicant, that the Board can be satisfied that EirGrid has justified the final line design as the optimum solution to meet the overall objectives of the development, having regard to strategic and environmental constraints and the technical requirements for the proposed development.

Following the consideration of alternative transmission and technology alternatives, I accept that it has been comprehensively demonstrated that the only

way to meet the strategic and technical need for the proposed development is to provide a new and physically separate high capacity interconnector.

I accept, having regard to the strategic importance of the proposed interconnector as part of the all-island transmission network, the lack of strong interconnection between Ireland and Northern Ireland and the overwhelming need for reliability and security of supply in terms of the all-island electricity market, that notwithstanding the alternatives considered and the advancements in technology, on balance it would appear that the most appropriate and cost effective technology to satisfy the requirements of the proposed North-South Interconnector development is an overhead high voltage alternating current power line.

5.5. Impacts on Health

5.5.1. Environmental Impact Statement

Chapter 8 of Volume 3B (Common Chapters) provides an overview of electric and magnetic fields and the criteria applied within Ireland and elsewhere in the EU to assess the potential for any significant health or environmental impacts. It provides information on calculated levels of Extremely Low Frequency Electromagnetic Fields (ELF EMF) that can be expected in the vicinity of the proposed 400kV line and summarises the results of scientific research conducted to investigate potential health effects. EMF is also addressed in Chapter 5 of Volume 3C and 3D of the EIS.

Electricity produces both electric and magnetic fields as it travels through overhead lines. The electric field depends on voltage and the higher the voltage, the higher the electric field. Electric fields are strongest close to a power line and their level reduces with distance. Electric fields are blocked by conducting obstacles such as trees, buildings etc. Consequently, indoor exposure to electric fields is largely dependent on indoor sources. The World Health Organisation (WHO) concluded in 2007 that there were no substantive health effects related to extremely low frequency (ELF) electric fields at levels generally encountered by the public.

Magnetic fields are produced by the flow of electric current, and the strength of the magnetic field varies directly with flow in the lines or cables. These fields, called electromagnetic fields are highest closest to an electric line or cable and are not blocked by trees, buildings etc. Therefore, indoor exposure may be influenced by both indoor and outdoor sources. Consequently, most of the health research relating to power lines has focussed on magnetic fields rather than electric fields.

Electromagnetic energy travels in waves and at different frequencies, which is measured in Hertz (Hz). The electric power system in Ireland operates at 50 Hz, which are in the extremely low frequency range (ELF). The transmission system operates to standards set out by the International Commission on Non-Ionising

Radiation Protection (ICNIRP), which was established in 1992. It is the independent standard-setting body for EMF which is recognised by the WHO and the EU. It provides scientifically based guidance and recommendations, including limits of exposure.

The EMF for the proposed transmission line is determined by the particular configuration and the tower type used in different sections of the route. The discussion of EMF in the EIS from the proposed transmission line is therefore divided into three separate transmission line tower cases. Over the vast majority of the route the proposed transmission line will be supported on single circuit intermediate lattice towers. In short portions elsewhere, the proposed line will be built in two additional configurations. These will include Double Circuit Lattice Towers in the MSA portion of the route and Single-Circuit Transposition Towers in the CMSA portion of the route.

The magnetic fields associated with the Single Circuit Lattice Tower sections of the transmission line supported on a combination of intermediate and angle towers is shown on Figure 8.3 Volume 3B (Common Chapters) of the EIS for both average and peak loading. The magnetic field diminishes with distance i.e. from approximately 16 µT (microtesla) directly beneath the line to 1.0 µT at 50 m and about 0.25 µT at 100m. Under peak loading conditions, the magnetic field will be higher, but is expected to occur rarely (possibly only a few hours per decade). However, it is considered in the EIS in order to assess the conditions likely to produce the highest magnetic field levels. In such conditions the magnetic field level beneath the line is calculated to be approximately 48 µT, well below the restriction levels (200 µT) specified in the guidelines (Table 8.2). The maximum magnetic field level, as well as field levels at ±50m and ±100m from the centreline, are shown at Table 8.5 and Table 8.6 for average and peak loading respectively.

The electric field level associated with the single circuit lattice towers is also calculated and shown in Fig 8.4. The maximum electric field levels beneath the transmission line is calculated at approximately 7.9 kV/m and will decrease to 0.20 kV/m at 50m, and 0.04 kV/m beyond 100m i.e. a 40-fold decrease at 50m and an almost 200-fold decrease at 100m. The electric field is not directly affected by

transmission line loading. The highest calculated electric field level, as well as levels at ±50m and ±100m are shown in Table 8.7.

Within the Meath Study Area (MSA) it is proposed to use the currently unused (northern) section of the existing double circuit lattice towers (which supports the Oldstreet to Woodland 400kV circuit) for the proposed development. The EMF on this short section of the line (2.85km), constructed on double circuit lattice towers, will differ from the EMF from the electricity on the single circuit lattice towers. The magnetic field is calculated to be highest beneath the electricity line conductors and decrease rapidly with distance. The maximum magnetic field beneath the electricity line for two lines operating on the double circuit lattice towers is calculated to be approximately 12-14µT depending on the selected phasing. Magnetic fields decrease more rapidly with distance for the optimal phase configuration than for non-optimal phasing configuration (Fig 8.10 and Fig 8.11).

The electric field from the existing and proposed new electricity line on the double circuit lattice towers is shown in Fig 8.14 (optimal phasing) and Figure 8.15 (non-optimal phasing). The electric field is calculated to be highest beneath the electricity line conductors and decrease rapidly with distance. The highest electric field is calculated to vary from approximately 8.0 to 8.8 kV/m depending on the phasing configuration selected, but will decrease to below 0.3 kV/m beyond 50m from the centre line and to 0.04kV/m beyond approximately 100m from the centreline regardless of the selected phasing, a reduction of over 200 fold (Table 8.7).

To facilitate the 400 kV OHL in the Cavan Monaghan Study Area (CSMA) minor alterations are required to be made to existing 110 kV (Lisdrum-Louth) OHL. Fig 8.1 shows the locations of the different sections of the electricity line route with different circuit configurations. EirGrid is proposing to perform a phase transposition requiring two transpositions towers on a short section of the line (extending for a distance of 765m between from Towers 118-121). The EMF from the electricity line on this short segment will differ from the EMF on the non-transposition towers.

The magnetic field associated with the electricity line supported by transposition lattice towers is shown in Fig 8.9. The magnetic field is calculated to be highest beneath the electricity line conductor and decreases rapidly with distance i.e. from 16 µT beneath the line to 1.0 µT at 50m and 0.25 µT at 100m. Similarly, the electric field level is calculated to be highest beneath the electricity line conductor and decrease rapidly with distance (Fig 8.13). The highest electric field is calculated to be approximately 8.0kV/m beneath the conductors, reducing to about 0.3kV/m at 50m and below 0.04kV/m beyond 100m.

EirGrid's electricity infrastructure complies with the European Union Recommendation on the Limits of Exposure to the General Public to Electromagnetic Fields (1999/15/EC). It is demonstrated in the EIS that the magnetic and electric fields produced by the 400 kV line will be below the EU exposure limits.

EMF only occurs when OHL are operational and accordingly no construction impacts arise.

5.5.2. Policy Context

The only county development plan that refers to EMF of high voltage (HV) power lines is the Cavan County Development Plan 2014-2020 which contains the follow objectives: -

Objective PI0110 - To ensure that high voltage electrical lines must be constructed and monitored in accordance with current 'Guidelines of the International Commission on Non-Ionising radiation protection (ICNIRP) and Commission for Energy Regulation (CER).

5.5.3. Issues raised by observers during the course of the application and during the oral hearing.

Issues regarding the impacts of electric and magnetic fields on human and animal health associated with the proposed high voltage transmission line were raised in a large number of submissions. The type of issues raised may be summarised as follows: -

- Concerns relating to adverse health effects associated with EMF due to the proximity of the development to homes, schools, workplaces, community facilities and leisure activities.
- Increased risk of childhood leukaemia.
- Increased risk of other cancers.
- Increased risk of other non-cancerous diseases.
- Impacts on children with autism.
- Impacts on pacemakers and other medical devices.
- Impacts on animal health.
  Impacts on crop production.
- Compliance with ICNIRP Guidelines.
- Inadequate assessment of health effects and refusal of EirGrid to indemnify against potential health effects.
- Other matters.

The applicant's response to the issues raised is contained in Chapter 7 and Appendix 7.1 & Appendix 10.1 of EirGrid's submission to the Board dated October 19th, 2015.

5.5.4. Oral Hearing

Impacts on Heath were discussed in Module 1.7 on 21st March, 2016 (Day 7 of the hearing).

Submissions were made by the following Observers in Part I of the hearing.

- Mr Margaret Marron (CMAPC).
- Dr P O'Reilly (NEPPC).
- Ms Aimee Treacy (NEPPC).
- Mr Pat Phelan (NEPPC).
- Paula & Michael Sheridan (NEPPC).
- Mr John Rodgers, Senior Counsel.
- Mr M O'Donnell, Senior Counsel.

During the consideration of Module 2.4 (Specific Landowner and Public Issues) the Irish Doctors Environmental Association was represented by Professor Robert Graham and Mr Kieran Hartley (Day 17).

In attendance for EirGrid were: -

- Dr William Bailey, (Principal Scientist, E^{x}ponent).
- Dr Gabor Mezei, (Medical Doctor and Senior Managing Scientist, E^{x}ponent).
- Mr Aidan Geoghegan, (Project Manager, EirGrid).
- Mr Jarlath Fitzsimons, (Senior Counsel, EirGrid).
- Dr Martin Hogan, (Medical Doctor and Occupational & Environmental Health Specialist) (Day 30).
- Mr Michael Sadlier (Equine Veterinary Surgeon (Day 11 & 22).

5.5.5. Assessment

The following provides an assessment of the various issues raised in the submissions and during the oral hearing. I would point out to the Board that the various papers, reviews etc., referred to in this section of the report are referenced in the EIS.

5.5.5.1. <u>Concerns relating to adverse health effects associated with EMF due to proximity of development to homes, schools, workplaces, community facilities and leisure activities close to line.</u>

Matters relating to impacts on public health have been raised in a large number of submissions. Electromagnetic Fields (EMF's) arising from the proposed development are perceived by the observers to have serious consequences for the health and well-being of those living, working, attending school and participating in leisure and community activities close to the line. There is anxiety in the community of the risk associated with continued exposure and it is considered that EirGrid has failed to take the issue of public health seriously and adopt precautionary levels similar to other European countries.

According to Dr P O'Reilly (NEPPC), the health effects associated with EMF is the single biggest issue from a public, landowner and community perspective. Whilst most of the concerns speculate about what may occur if the overhead line is constructed, Dr O' Reilly stated that the proposal to use the redundant arms of existing towers feeding into Woodlands sub-station, provides insights into the actual health effects experienced by people living close to existing high voltage overhead lines. He argued that whilst EirGrid say they comply with ICNIRP guideline limits, compliance is not a measure of safety. He considers that the guideline levels are set significantly above, instead of below, levels where health issues have been documented.

Many of the observers refer to published reports to support their concerns regarding possible health effects associated with proximity to overhead lines and exposure to extremely low frequency electric and magnetic fields (ELF EMF). A paper by Draper et al., in 2005 is the most frequently referenced. This paper established an association between proximity to overhead lines and childhood leukaemia and is discussed in more detail below. The classification of ELF EMF in the 2B category as 'possibly carcinogenic to humans' by the International Agency for Cancer Research (IARC) is another cause of considerable concern for many of the observers.

The EIS provides a comprehensive overview of scientific research, reviews and published reports on the subject. It notes that since the late 1970's extensive scientific research has been carried out to investigate whether there are potential health effects associated with ELF EMF exposure. Following the publication in 1979 of an epidemiology study by Wertheimer and Leeper that suggested an association between childhood cancer and proximity of the children's homes to powerlines, numerous epidemiology studies have been published. These studies investigated many health outcomes, in both adults and children, including cancer and non-cancerous diseases such as heart disease, and reproductive effects.

By the turn of the millennium independent review bodies were carrying out weight of evidence reviews of the ELF EMF health research literature. These included the World Health Organisation (WHO) and the EU organisations. In 2001, the International Agency for Research on Cancer (IARC) carried out such a review. As an agency of the WHO, which is considered the primary organisation for cancer risk assessment, it regularly and systematically reviews various physical and chemical agents and exposure scenarios, to determine their potential for carcinogenicity in humans.

The IARC classification of ELF EMF in the 2B category as 'possibly carcinogenic to humans' was heavily influenced by two pooled analyses that combined and analysed data from available childhood leukemia epidemiological studies. Whilst the pooled analyses showed a statistical association, it did not provide any support for a carcinogenic effect. This classification implies that the reported association was considered credible but causality was not established.

In his evidence to the oral hearing Dr Bailey (EirGrid) pointed out that the IARC guidelines have been widely misunderstood. He stated that exposure to magnetic fields was classified in the Class 2B category solely because of limited evidence from epidemiological studies. All this categorisation recognises is that there is a statistical association and there is no evidence that this association is supported by biological evidence that would make the association plausible. Commenting on the misunderstanding that arises in relation to EMF as 'possible carcinogen', Dr Mezei (EirGrid) stated 'that it is not proof of an association, but almost resembles the lack of firm association because the evidence is not sufficiently strong to put it in the non-carcinogenic category or the probable carcinogenic category'.

The second and most comprehensive weight of evidence review of both cancer and non-cancer health outcomes and ELF EMF exposure has been conducted by the WHO, which published its Environmental Health Criteria (EHC) report on ELF EMF in 2007. The EHC report confirmed the earlier conclusion of IARC about the limited evidence from epidemiological studies of childhood leukaemia and ELF EMF and inadequate evidence from in vivo studies. The EHC report did recognise the statistical association between childhood leukaemia and exposure to high

levels of magnetic fields, but could not rule out the possible effect of other factors (chance, bias etc.) on these results. For all other cancers, reproductive effects, neurodegenerative diseases, cardiovascular diseases, and breast cancer in particular, the EHC concluded that the evidence does not support an association with ELF EMF.

The third review of note was conducted by the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). It is the European Union's scientific committee that provides independent scientific opinions to guide policies of the European Commission on emerging or newly identified health and environmental risk and on risks to consumer safety, public health and related issues. It has conducted scientific reviews of potential health effects associated with EMF and has issued opinions in 2007, 2009 and 2015. The reports did not confirm the existence of any adverse health effects.

In Ireland in the same year, the Department of Communications, Marine and Natural Resources (DCMNR) assembled an expert group that also reviewed the evidence on ELF EMF and health effects. The conclusions of this group were consistent with those of the EHC.

As noted above, the paper by Draper et al (2005) is one of the reports most commented on by the observers, to support their arguments of negative health outcomes. It was peer reviewed and published by the British Medical Journal. The study was considered to be scientifically rigorous, but subject to limitations, in that it was confined to a desktop study and did not take into account EMF within the house and from other sources. I note that Brunch et al., 2014 updated and extended the previous report by Draper and it reported no overall association with residential proximity to 132 kV, 275 kV and 400 KV power lines for leukaemia or any other cancer among children. The statistical association with distance that was reported in the earlier study was not apparent in the extended analyses.

There is also frequent reference by the observers to another report which supports an alternative view. The report entitled the BioInitiative Report 2007 (updated

2012) was published by the BioInitiative Group. The conclusions from this report differ from the previously mentioned reviews, and suggest that in addition to childhood leukaemia, a number of other health outcomes are linked to ELF EMF and that exposure limits are insufficient.

The report has been heavily criticized by independent and governmental research groups for its lack of balance and rigorous evaluation of the scientific evidence. It was not sanctioned by any professional or scientific organisation. The review did not follow the weight of evidence approach and the conclusions were not developed as consensus opinions, but were the opinions of individual authors. The 'evidence' is contrary to previously mentioned weight of evidence reviews, such as the WHO (2007) and SCENIHR (2009) (2009) and (2015).

It is also asserted by some observers that the application is premature pending publication of a review of the health effects of electromagnetic fields by the Department of the Environment. In this context, I draw the attention of the Board to the recently published report entitled 'Electromagnetic Fields in the Irish Context'. The Irish Government commissioned the National Institute for Public Health and the Environment of the Netherlands (RIVM) to report on the current scientific knowledge on the possible health effects of exposure to EMF. The report which was published in 2015, focused on the potential effects that arise from exposure of the public to EMF from high voltage power lines.

The conclusions reached in the report are in line with the conclusions of the SCENIHR in its 2015 Opinion and it re-affirms the overall conclusions of the 2007 Expert Group commissioned by the Irish Government. It concludes that based on current findings, the evidence for the various potential long-term health effects of exposure to ELF with strengths below the limits in the European recommendation is limited or inconsistent.

In response to the argument made by Dr P O' Reilly that compliance with the guidelines is not a measure of safety, I would point out to the Board that the Council of the European Union has recommended limits on the strength of EMF to which members of the general public may be exposed. These recommendations

are based on guidelines provided by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), which in turn are based on the known health effects of these fields. In establishing the guidelines, ICNIRP's main objective was '*to establish guidelines for limiting exposure to electric and magnetic fields that will provide protection against all established adverse health effects'*. Whilst other countries (i.e. Sweden, Netherlands) are noted to adopt a more precautionary approach to the location of power lines to minimise exposure (below 0.4 microtesla) and to increase separation distances to houses, the guideline limits set by ICNIRP are considered to provide adequate protection.

The main focus of the submission from the Irish Doctors Environmental Association (Professor Graham Roberts and Mr Kieran Hartley) was compliance with Government documentation 'Health Effects of EMF', (DCMNR, 2007) and in particular its recommendations regarding strict compliance with ICNIRP guidelines and the siting of new power lines away from heavily populated areas.

The European recommendation is not legally binding but has been adopted by the Commission for Energy Regulation. EirGrid is required to comply with the EU/ICNIRP limits to ensure both the protection of the health, safety and welfare of its staff and the general public. There is no suggestion in the application documentation that the proposed development will be developed other than in compliance with the guidelines. With regard to siting of powerlines, the proposed development is routed away from towns and major centres of population, through rural countries with low population densities.

Dr Bailey noted that despite the fact that exposure to ELF EMF has been identified as a potential risk to human health, it has been studied for over 40 years and at normal exposure levels, no hazards have been identified. He stated that when formulating guidelines, the WHO and ICNIRP reviewed all the research, determined what evidence there was for adverse effects and then proposed guidelines for occupational and public exposure. The guidelines set limits far lower than the levels that are associated with a known or potential hazard. He stated that the levels associated with the proposed project were assessed by modelling

and based on the characteristics of the proposed development and it has been determined that the calculated electric and magnetic fields fall below the ICNIRP guidelines.

To conclude, the relevant scientific literature has been repeatedly and systematically reviewed by a number of international and national health, scientific and governmental agencies, all of which conclude that the available evidence does not confirm the existence of any health consequence from exposure to ELF EMF. The proposed development will be designed and operated to comply with ICNIRP guidelines to ensure protection of public health.

5.5.5.2. Increased risk of childhood leukaemia

The observers refer to research which states that exposure to electromagnetic fields above 0.4 µT (microtesla) increases the risk of leukaemia, particularly for children. It is argued that the link between EMF and childhood leukaemia is statistically significant and that the guideline limits are set significantly above where health issues have been documented i.e. that while concerns were shown at 0.4 µT, the compliance level is 100 µT.

There has been considerable research into possible linkages between proximity to power lines and childhood leukaemia. Pooled analysis of previously published singular studies were conducted by Ahlbom et al., (2000) and Greenland et al., (2000) which suggested possible associations between childhood leukaemia and ELF EMF where the average magnetic field strength was greater than 0.3-0.4µT. However, the results of the pooled analyses were considered to provide only limited epidemiological support for a causal relationship. Further pooled analysis of childhood leukaemia epidemiological studies published between 2000 and 2010 was conducted in 2010 (Kheifets et al., 2010). Whilst it showed a positive association at exposure levels above 0.3 and 0.4 µT, the association was weaker and not statistically significant. Several subsequent studies are documented in the EIS and in applicant’s response (Appendix 7.1) none of which establish a statistically significant or causal relationship between childhood leukaemia and residential proximity to power lines.

Draper et al., in 2005 used distance of mother's home from high voltage overhead transmission lines (predominantly 275 kV and 400 kV) at the time of her child's birth as a proxy for her child's subsequent exposure to power-frequency magnetic fields. Children were aged between 0-14 years and born in England and Wales between 1962-1995. The study concluded that there was an association between residential proximity to high voltage overhead power lines and childhood leukaemia. The study had deficiencies in that it did not consider exposure to EMF within the household or from other sources. It established an association, but the evidence was not strong enough to draw a firm conclusion that magnetic fields cause childhood leukaemia.

In a more up to date, and much larger than Draper's 2005 study, Bunch et al (2014) added 13 more years of data and included Scotland in their study. The results from this study failed to find the statistical association found by Draper et al. (2005). Dr Mezei (EirGrid) in his submission to the oral hearing noted that more recent studies from Denmark, France and other countries showed no statistically significant association between childhood leukaemia and residential proximity to high voltage power lines. More recent pooled analysis (Schuz et al.,2012) also concluded that exposure to ELF magnetic fields had no impact on the survival probability or risk of relapse in children with leukaemia.

In conclusion, while epidemiological research carried out over an extended period has shown some association between long term exposure to ELF magnetic fields from high voltage overhead power lines and an increased prevalence of childhood leukaemia, the health effects are unproven. The relationship fails to show how long lasting exposure to ELF magnetic fields from power lines actually causes an increase in childhood leukaemia, i.e. causality has not been established. I would point out to the Board that it is the view of the ICNIRP that "the currently available existing scientific evidence that prolonged exposure to low frequency magnetic fields is causally related with an increased risk of childhood leukaemia is too weak to form the basis for exposure guidelines. In particular, if the relationship is not

causal, then no benefit would accrue from reducing exposure" (EMF Factsheet ICNIRP, 2010)

5.5.5.3. Increased risk of other cancers

Submissions were made at the oral hearing by Mr Pat Phelan and Paula & Michael Sheridan, who have had serious health issues, which they attribute to living in close proximity to the line. Mr Pat Phelan lives in Curraghtown and has suffered from cancer (Submission 7a). Paula & Michael Sheridan live close to the existing Woodlands substation and have lived with the existing OHL traversing the rear of their property for over 30 years (Submission 7b). It is contended by Dr P O'Reilly (NEEPC) that the experiences of these individuals demonstrated the health effects associated with existing high voltage lines.

The proposed development, if it goes ahead would result in additional conductors being fitted onto the northern arm of the existing towers bringing the overhead line even closer to the Sheridan's home (32m). Both Mr & Mrs Sheridan have suffered from cancer. In her submission to the oral hearing Mrs Sheridan stated that the medical and scientific advice available to them confirmed that both their life-threatening illnesses were probably related to EMF exposure. Blood tests revealed that both have very low melatonin levels, which they attribute to exposure to high levels of EMF over the years. Their health issues have forced them to move out of their home and into rented accommodation.

It is contended in other submissions that proximity to overhead high voltage power lines would increase the potential for other cancers in the population. Reference was made in particular to breast cancer, brain cancer and adult leukaemia.

The potential health effects of ELF EMF fields on various cancers has been researched. To date, there is insufficient evidence for a relationship between exposure to ELF magnetic and electric fields and adult cancers (IARC, 2002; WHO, 2007; DCMNR, 2007: ICNIRP, 2010; EFRAN, 2012[17], SSM[18], 2014; and SCENIHR, 2015).

[17] European Health Risk Assessment Network on Electromagnetic Fields (EFRAN)

In the case of breast cancer, no consistent associations have been reported in the literature. Early studies, based on a hypothesis that ELF EMF suppressed production of night-time melatonin (reported to have tumour suppressing effects) have suggested an association between decreased melatonin levels and breast cancer. Human laboratory studies, however, were unable to consistently confirm these findings. All recent studies examining both proximity to homes and occupational exposure (the use of electric blankets of example) have concluded that there is no association between breast cancer and ELF EMF. Therefore, for breast cancer there is sufficient evidence for the absence of a relationship with ELF exposure and this is accepted by scientific organisations (WHO, 2007; SSM, 2014).

Whilst the Sheridan's seek to link cancer occurrence with low melatonin levels and proximity to the existing high voltage OHL's, research in this area has found no conclusive evidence to suggest an association or adverse health outcomes. Initial research (Stevens 1987) which concluded that exposure to ELF magnetic fields may decrease production of melatonin and increase the risk of breast cancer have not been supported by later studies.

Mrs Sheridan referred to more recent research by Professor Denis Henshaw and to a book published by Professor Russ Reiter in 1994/95 which documented the effects of EMF on melatonin production and which she said were ignored by EirGrid. Mr J Rogers SC, on behalf of the observers stated during the oral hearing that Professor Henshaw had confirmed that the very low levels of melatonin in blood samples taken from the Sheridan's were a result of exposure to magnetic fields arising from the 400kV power line crossing their land close to their home.

Dr Bailey (EirGrid) in response noted that melatonin production in the body can be suppressed by dozens of pharmaceuticals such as anti-hypertensives, sedatives, beta blockers, etc. He also points to the Health Protection Agency in the UK who assembled an expert panel in 2006 to review the idea that reduced melatonin

[18] Swedish Radiation Safety Authority (SSM)

posed a risk to human health. No convincing evidence was found that EMFs affect levels of melatonin in humans. Dr Bailey stated that recent research would not reach similar conclusions to that reached by Henshaw and Reiter. He noted, for example, that no relationship was found between ELF magnetic fields and changes in the neuroendocrine system (WHO, 2007; ICNIRP, 2010).

Dr Bailey stated that many health conditions including cancer are multifactorial and depend upon a genetic background, our age and environmental conditions. He cautioned against reaching conclusions regarding the health implications of EMF cannot be reached by picking out studies that appear to support our opinions and ignoring those that do not. All of the evidence must be evaluated irrespective of what the conclusions might be.

Brain cancer and adult leukaemia diseases are among the most studied diseases in ELF EMF epidemiology, given the number of people employed in electrical power generation and transmission. The relevant bodies have reviewed the studies and once again they report that the epidemiologic evidence does not support a cause and effect relationship between ELF EMF and adult leukaemia or brain cancer. Relevant reports are those produced by the WHO (2007), SCENIHR (2009) and (2013) and EFHRAN (2010).

It should also be noted that other cancers, such as prostrate, pancreatic, lung, kidney and testicular have been investigated in relation to ELF EMF exposure. No basis for an association has been found.

5.5.5.4. Increased risk of other non-cancerous diseases

Many of the observers commented on impacts on human reproduction and the health effects arising from potential increases in cardiovascular, Alzheimer’s and other neurodegenerative diseases and from electromagnetic hypersensitivity associated with EMF.

Potential links with various reproductive outcomes such as miscarriage and low birth weight have been extensively studied. Research by SCENIHR (2013) did not

show an effect of ELF EMF on the reproductive function in humans. An English study by de Vocht et al., (2014) was referred to during the oral hearing. Whilst it showed an association between reduction in birth weight and residential proximity to power lines, it did not show any association with other pregnancy outcomes. Dr Mezei (EirGrid) commented on the severe limitations of this study stated that information and possible confounders such as smoking were not included. He noted that there were other studies that looked at birth outcomes and residential proximity to power lines and overall the evidence does not support an association. Dr Mezei also referred to the most recent SCENIHR report published in 2015 and the strong and recent conclusion that *'recent results do not show an effect of magnetic fields on reproductive function in humans'* and the statement that *'epidemiological studies in this area show no evidence for adverse pregnancy outcomes'*.

I also note that no relation was found between reproductive and developmental abnormalities e.g. still birth, preterm birth, low birth weight (SCENIHR 2015; EFHRAN, 2012; ICNIRP, 2010).

Whilst some studies from the 1990's suggested an association between ELF EMF and cardiovascular disease and overall assessment of the literature led the WHO in 2007 to conclude that 'the evidence does not support an association between ELF EMF and cardiovascular disease'. This was supported by DCMNR, 2007; ICNIRP in 2010, EFRAN in 2012 and SSM in 2014.

In her submission to the hearing Ms Aimee Tracy (NEPPC), referred to the 2011 International Scientific Conference on EMF and Health where it was stated that that some evidence has been found on a possible association between ELF exposure and some neurodegenerative diseases. The EIS refers to various research studies conducted to investigate potential associations between exposure to ELF EMF and neurodegenerative disease. These have investigated residential proximity to high voltage power lines and mortality due to neurodegenerative disease with generally inconclusive results. The SCENIR (2013) report stated that these studies do not provide convincing evidence of an

increased risk of neurodegenerative diseases or dementia related to ELF-EMF exposure and do not provide support for its previous conclusion that magnetic field exposure increases the risk for Alzheimer's disease.

A large study published in 2014, examined mortality due to neurodegenerative diseases (Alzheimer's, Parkinson's and motor neuron disease) and occupational exposure to magnetic fields among more than 70,000 electric power company workers in the UK (Sorahan and Mohammed, 2014). The authors reported no statistically significant association between any of the investigated diseases and lifetime, recent or distant exposure to magnetic fields.

Dr Mezei commented on specific studies linking Alzheimer's to residential property to power lines (*Haass et al*.), which he said had serious limitations. He pointed out that he participated in a study in Denmark which reported that there was *'no association between neurodegenerative diseases and occupational exposure to magnetic fields'* (*Fry et al*) published in 2013. He also brought to the attention of the hearing the importance of the most recent SCENIHR (2015) report in terms of the conclusions drawn on neurodegenerative diseases which states *'the epidemiological studies do not provide convincing evidence of an increased risk of neurodegenerative diseases (including dementia) related to power frequency magnetic field exposure'.* However, it is acknowledged that more research may be required.

Concerns about the possibility of a link between low level EMF and non-specific physical symptoms has led to a number of epidemiological and experimental studies in the past ten years. Electromagnetic hypersensitivity (EHS) is very controversial and is characterised by a variety of non-specific symptoms that differ from individual to individual. Some individuals report that they are able to detect EMF when they have been exposed to fields that are below the limits in the European recommendation. Others report that they experience a variety of physical and mental health problems such as fatigue, headache, depression, dizziness and problems with sleeping after exposure to EMF.

Research conducted so far has not found scientifically conclusive evidence for the ability of people to detect low-level EMF or for a causal relationship between EMF and non-specific symptoms (ICNIRP, 2009; AGNIR, 2012; Demers et al., 2014 SCENIHR, 2015; SSM, 2014). The SCENIHR 2015 reported that '*studies published since 2009 show discordant results. Observational studies suffered from weaknesses and do not provide convincing evidence of an effect of ELF exposure on symptoms in the general population and most experimental evidence also points to the absence of any causal effect'.*

Scientific tests and reviews of the evidence have concluded that there is no causal link between symptoms and actual EMF exposure.

Commenting on Mrs Sheridan's claim that persistent nerve pain which she experiences subsides when she leaves her home for a period of time, Dr Mezei confirmed that there is no nerve stimulation below ICNIRP limits and that the purpose of setting the guideline was to prevent this.

5.5.5.5. Impacts on children with Autism

According to Irish Autism Action (IAA) the exact cause of autism spectrum disorder (ASD) is currently unknown. It is a complex condition and may occur as a result of genetic predisposition (a natural tendency), environmental or unknown factors. Despite years of research no clear answer has been found for its genetic and environmental causes. The symptoms of autism are highly diverse and include social interaction difficulties, communication challenges and sensory sensitivity.

Dr Mezei (EirGrid) stated in his submission to the hearing that there is no link between autism and EMF and accordingly no epidemiological studies have been published on the topic. He did accept that children with autism have altered sensory processes to external stimuli such as noise

The focus during the oral hearing was not on the causes of autism, but on the effects of the everyday environment on children with autism and their families. A

number of people including Ms Geraldine Gaydon (Day 24) representing the Mc Elroy family, Mrs Ciara Tarrant, Mr Francis Clarke and Ms Samantha Killick all focused on the lack of understanding of the implications of sensory overload for individuals with autism. Ms Gaydon (Submission 43 & 44) stated that changes to an individual's environment, even those that are perceived by others to be insignificant, can cause people with autism to experience extreme levels of stress. She mentioned intermittent noise or buzzing from power lines as an example and noted that the Mc Elroy's, who have a son with autism, already have 38 kV poles within 50m of their home. When the air is damp the lines emit a hissing noise, which effects their son's behaviour. The concern was that the proposal will result in the erection of three additional towers close to their home, which will impact on their son's quality of life due to his hypersensitivity to sound. The only solution she said was to place the alignment underground.

Each of the observers spoke about how autism affects children in different ways and at different times. Each child has different behavioural and sensory issues. They all spoke about the lack of understanding of the disorder and how children with autism process noise differently. This causes pain and induces behavioural problems, sleep and eating problems, which affects not only the individual but the entire family.

Ms Samatha Killick, spoke about her experience as a person with ASD and her inability to filter out noise and as result her ability to communicate effectively. To cope with sensory overload individuals with ASD need downtime to desensitise and the only place that you can do this is in the home. She needs quiet or otherwise she cannot function. The concern is that if the pylons are erected close to homes, the quiet place to desensitise will be removed.

Dr Martin Hogan, Medical Doctor and Occupational & Environmental Health Specialist responding on behalf of EirGrid (Day 30), accepted that autism could affect up to 1% of the population. He also accepted that some children with autism are susceptible to noise, in that they process it differently. Relatively minor noises can affect them and can become a dominant source as they cannot filter it out in the same way as other people. He stated that he had reviewed literature on the

effects of overhead power lines and associated noise on children with ASD. He noted the vast amounts of high voltage power lines across the UK and Europe and that these types of power lines have been in existence for in excess of 30 years. One would expect that if there was a problem that it would have made its way into medical literature.

Mr Fitzsimmons SC (EirGrid) stated that the existing 38 kV line over the Mc Elroy's property would be removed and replaced with an underground cable, which would remove that noise source referred to by Mrs Mc Elroy. Mr Barry Sheridan (EirGrid) noted that the proposed overhead line would be twice the distance away from the back of the house, traversing the corner of property at 73.3m from the centreline. The noise level within the house would be 23.4 dB L_{night} which is well below the WHO 2009 guideline limit of 30 dB L_{night}. This level would be a worst case scenario where the corona effect exists. It was also confirmed that composite insulators are proposed, instead of glass insulators (which condense at a lower dew point) to further mitigate the potential for corona noise. It was confirmed by Mr Brennan that Mrs Tarrant's and Mr Clarke's properties will be 470m and 126m respectively from the OHL and that noise levels will be significantly below WHO nightime guideline limits.

Dr Hogan (EirGrid) noted that the WHO guidelines are health based and are designed to protect the most vulnerable, which would include individuals with ASD. He reiterated that noise levels for the proposed development had been calculated and that not alone is it in compliance, but is significantly below the guideline level. He hoped this would provide some level of comfort to the observers.

In response, Ms Graydon stated that she could understand why there was little evidence in medical literature, as it is only now that we are becoming aware of how people with ASD hear noise. She stressed that autistic children hear differently to other people. Whilst the undergrounding of the 38kV line is welcome, it will be replaced by another noise source that cannot be predicted. The noise will continue to bother individuals with ASD, unless it is eliminated completely. The

environmental impact on people with autism and other sensory conditions has to be taken into account, as it impacts on their lives.

Mr Clarke responded, stating that he was not reassured by what he had heard. It was his contention that the WHO guidelines were looking at the general population and that they did not look at specific elements within that population. Dr Hogan stated that noise is an issue that has to be considered as an everyday difficulty for people with ASD and their families. The question is whether the OHL will make the situation significantly worse. He said the WHO guidelines do consider sensitive individuals and for something like noise, one has to consider those with ASD as most sensitive. The WHO levels are set very low and the levels that will be experienced will be below those values. It was his opinion that the lack of medical literature is telling, given the length of high voltage lines that exists and the populations living in close proximity. He found it hard to believe that if there was a problem that was suffered by many, that there would not be significant evidence in the literature.

Ms Graydon re-iterated that the reason that there is no medical literature is because we are only now beginning to understand what is happening to people with autism and we are also now beginning to communicate better with these individuals. Research she said focused on genetics rather than on environmental effects. She played a recording to the hearing to demonstrate the type of noise that would be experienced. She confirmed under questioning from the Inspector that the recording was taken from YouTube video made adjacent to a transformer. Dr Hogan noted that the magnitude of volume was significantly higher than the value that would be heard.

When questioned about measures that could be undertaken to reduce the impacts of the noise, Ms Killick stated that anything that could filter out the noise would be beneficial. Ms Graydon stated that the Mc Elroy's had fitted double-glazing, this did not eliminate the problem during bad weather. She also stated that unlike other house noises that could be switched off, noise from the OHL was unpredictable and couldn't be switched off.

Dr Hogan stated that he is not persuaded that the proposal will add in any significant way to the difficulties that are currently being encountered. The observers contend that it is adding another difficulty to the lives of children with ASD and their families. Mr Fitzsimons stated that the line has been designed to ensure compliance with a number of health relevant guidelines including ICNIRP, IARC and the WHO noise level. Where guideline parameters are met in every instance by the design of the line, EirGrid does not anticipate any difficulty.

I would point out to the Board that the corona effect was observed during site inspections in foggy conditions close to Woodlands sub-station in a very quiet rural environment. Noise levels were observed close to a tower and at 50m and 100m intervals in an environment where the only other discernible noise sources were bird song and the movement of leaves in trees/hedgerows. Whilst corona noise was clearly audible in close proximity to the tower, it dissipated significantly with distance. It was still audible at 50m but barely discernible at 100m. With the exception of the Mc Elroy properties, the Clarke and Tarrant family homes are located in excess of 100m, which will impact on the level of noise detected. St Oliver Plunkett National School, which has an autistic unit is in excess of 1 km west of the alignment.

Whilst the evidence would suggest that autistic children process noise differently, and I do not in any way wish to undermine the hardship that these families encounter on a daily basis, I also accept that the everyday environment contains multiple noise sources outside the family home, such as farm machinery etc., which may occur at closer ranges and which the families of autistic children do not have the ability to control. I also accept that the corona effect will only occur under certain meteorological conditions and that the evidence would suggest that the use of composite condensers as proposed, coupled with distance will help to mitigate the effect.

5.5.5.6. Impacts on pacemakers and other medical devices

A number of submissions raise issues regarding interference with pacemakers and other medical devices. This was of particular concerns to farmers who could

potentially have to cross under the OHL numerous times a day. It is recognised in the EIS that external electric signals may potentially interfere or disrupt the normal functioning and operation of pacemakers and other medical devices, a phenomena called electromagnetic interference.
I note from the information presented in the EIS that most modern devices incorporate various technological safeguards to protect against interference. The designs specifically reduce the potential for electromagnetic interference. It was confirmed by Dr Bailey at the hearing that pacemakers have a failsafe function where if the pacemaker senses interference, the device will go into an automatic pacing mode and will continue stimulating the heart until it senses that the interference is over. The EIS refers to various studies carried out in different scenarios and none suggest significant evidence of interference from high voltage lines.

Dr Bailey in his evidence to the oral hearing confirmed that a search of databases that records reports of interference to pacemakers and other medical devices in the UK and the US had been carried out. Whilst there were records of interference from a variety of electronic devices such as security screening, speakers etc., no evidence of transmission line interference had been found. He stated that the United Stated Food and Drug Administration holds a database of implanted device malfunctions. As of August 2014 there have been no identified episodes of interference in the proper working of these devices from EMF.

Mr Hillis (CMAPC) referred to the European Committee for Electrotechnical Standardisation (CENELEC) and their reference levels for general exposure. From this it was his understanding that people with implanted medical devices should not be exposed to reference levels that exceeded 5.0 kV/m and 100 µT. It is acknowledged in the EIS that for the transmission line configurations proposed as part of the project, the general magnetic field levels will not be exceeded over any portion of the line and the electric field level will be above 5.0kV/m reference level only within 17m (approximately) of the transmission tower centreline. For the majority of people exposure in excess of the reference level would only occur for a very short period or transient periods in which case these exposures would be acceptable for implanted medical devices. For persons with a device who would

spend significant time close to the transmission line centreline or work in the open air, consultation with their doctor may be required to determine the compatibility of their device with higher electric fields.

Mr Hillis questioned whether it was acceptable that individuals with devices would be exposed to reference level that was exceeded within 17m of the OHL. Dr Bailey stated that the supposition that all devices function in the same way or have the same susceptibility is incorrect. He also noted that experimental reports have determined that different types of pacemakers can demonstrate different types of responses, from some that are virtually immune to interference at 50 or 60 Hz and others that have a strong response. The advice is for patients to consult their doctor and to take their guidance regarding the type of exposure their device may have.

5.5.5.7. Impacts on animals and animal health

Concerns have also been expressed by the observers regarding impacts of EMF on animal health, behaviour, productivity, fertility etc. Mr Pat Phelan who lives beside the existing 400 kV line documented his experiences with regard to his Limousin herd and breeding difficulties, which he attributes to the existing high voltage line. The NEPPC quotes from the Journal of Dairy Science 1996 on adverse impacts on milk production and reproductive outcomes in cows, lower red blood cell counts in horses and aggression in pigs associated with EMF. Ms Aimee Tracey (NEPPC) in her submission referred to studies carried out in 1996 and 1999 which found that exposure to EMF resulted in biological responses in cows.

Issues have also been raised regarding impacts on poultry and egg production. Many of the submissions refer to a court ruling in France in 2008, which ordered the operator of a French electricity company to pay damages to a Mr. Marcouyoux for health effects in cows and pigs allegedly caused by a high voltage transmission line.

Numerous studies have been carried out to investigate effects on domestic animals and on wildlife. The vast majority of animal studies, excluding laboratory animal studies, focus on large domesticated mammals and economically important species such as cows, pigs, sheep and chickens. Horses have been studied but the literature is not as vast as it is for those species directly associated with farming and the human food chain.

It is interesting to note that exposure of quadrupeds to EMF is considerably lower than humans because of differences in body shape and grounding. Models and some measurements, predict a 50% lower exposure to an electric field directly underneath a power line. In the case of horses and farm animals therefore, the literature tends to be in agreement with the (WHO) 2007 determination that current evidence does not confirm the existence of any health consequence from exposure to ELF EMF.

Various studies have been designed to assess the potential effect of electric and magnetic fields on milk production, fertility, hormone levels etc. It is acknowledged in the EIS that whilst some of the studies showed difference in milk fat content and dry matter intake, the differences were not consistently observed and none were in excess of normal variations. Similarly, studies carried out to investigate impacts on hormone levels, weight gain, wool production etc. in sheep displayed variations in some parameters but no changes were consistently observed.

Dr Mezei commenting on the reports mentioned at the hearing, accepted that some well conducted experimental studies of dairy cows and potential effects of electric and magnetic fields were carried out. He accepted that there were some variations in the variables investigated such as milk production, behavioural elements and hormone levels and some were statistically significant. However, the field levels were very high compared to those associated with transmission lines and none of the changes were consistently repeated in a series of experiments. The overall conclusion was that whilst some variability was observed, it did not support that magnetic field exposure was detrimental to dairy cow health.

During his submission to the oral hearing Mr Con Curtin (EirGrid) confirmed that there was no evidence to suggest that the health or welfare of farm animals including sheep, cows, poultry or other livestock would be compromised by the proposed development. He noted that there are existing 400kV lines traversing the Irish rural countryside and farming activity continues to take place successfully. Mr Curtin also noted that none of the literature from the Department of Agriculture Food and the Marine, Bord Bia (Quality Assurance Standards) or the IOFGA Organic Food and Farming Standard referred to potential animal health or crop effects resulting from overhead lines.

The response document also notes that horses have not been a species of interest to scientists conducting EMF research. Mr Michael P Sadlier Equine Veterinary Surgeon (EirGrid), provided evidence to the hearing of impact of the development on the health and welfare of horses. He noted that animals become habituated quite quickly to whatever stimuli they are exposed to, once they realise there is no physical threat, they do not react. He noted the example of Castlemartin Stud Farm where a yearling shed has been erected close to an existing 400 kV line and there was no evidence to suggest any adverse impacts on thoroughbred racehorses.

Whilst earlier studies reported impacts on animal health and welfare, evidence of a causal relationship with EMF has not been proven. The WHO 2007 have stated that *'studies performed to date have found little evidence of EMF effects on fauna at levels below ICNIRP's guideline levels. In particular, there were no adverse effects found on cattle grazing below power lines'*.

It is of note that on March 1st 2010, a court appeal overturned the decision in the Marcouyoux case. It directed that *"given the explanation and data provided in this case, there are no grounds to establish a sufficiently characteristic link of causality".*

5.5.5.8. Impacts on plants

The EIS includes a review of scientific literature on the potential effect of ELF EMF from transmission lines on plants, including agricultural crops and trees and forest and woodland vegetation. No confirmed adverse effects on plants, crop production were reported due to EMF exposures, with the exception of damage to the tops of trees growing within 13m of an experimental transmission line operating at 1200 kV.

5.5.5.9. Compliance with ICNIRP Guidelines

Mr & Mrs Sheridan (observers) raised issues regarding EMF exposure levels on their property. Mr Geoghegan (EirGrid) confirmed two surveys were undertaken by EirGrid in 2010 and 2013. The surveys were carried out at various locations to measure the levels of 50HZ EMF emanating from the existing 400 kV line crossing through their property. These surveys confirmed that the fields measured were extremely low, relative to the levels set down in the INCNIRP and EU Guidelines on continuous exposures to EMF. In response to the arguments made that the levels taken were lower than those taken by Mr Sheridan, Mr Geoghegan stated that that meter used by Mr Sheridan showed a large margin of error when calibrated and this would explain the difference.

Mr O'Donnell (observer) queried whether the provision of the additional circuit on the unused section of the existing Moneypoint to Woodlands 400 kV line would double the magnetic field over Sheridan's property. Mr Geoghegan confirmed that in a worst case scenario the level would be 41 µT. This would be the level at the point of maximum sag (9m) and the conductor will not be as low as this over the Sheridan's property.

Mr Geoghegan confirmed that optimised phasing is proposed which will result in a slight cancelling out of EMF (Fig 5.4 and 5.5 Volume 3D). The effect will be that EMF will be reduced with distance away from the line. If optimal phasing was not adopted, then both the magnetic and electric field levels would be higher than the existing line at all locations. Optimal phasing is a mitigation measure to reduce magnetic and electric field levels in the double circuit portion of the route.

It was confirmed by Mr Geoghegan (EirGrid) in response to questions by Mr & Mrs Sheridan during the oral hearing that the ICNIRP reference level of 5 kV/m for electric fields would not be exceeded. Mr Geoghegan pointed to the difference between the basic restriction level and the reference level and stated that the basic restriction of 9 kV/m would not be exceeded at any point along the line.

Dr O Reilly (NEPPC) queried what the electric field levels would be over Mr & Mrs Sheridan's garden, noting that the 8.8 kV/m exposure level referred to in the EIS (Section 5.5.3.4 of Volume 3D) comes very close to the basic restriction of 9 kV/m specified in the ICNIRP guidelines. In his response Mr Geoghegan stated that the level of 8.8 kV/m referred to non-optimised phasing. The conductors on the double circuit section will be configured for optimal phasing which will result in a reduction of electric field levels to 7.1 kV/m.

Dr O Reilly referred to the EIS noting that there will be situations where non-optimised phasing will occur and sought clarity on the frequency of such events. It was clarified by Mr Geoghegan that non-optimised phasing may occur occasionally for short durations. He stated that contrary to what is stated in the EIS power flow reversal on the overhead line would not result in a voltage reversal and accordingly electric field levels would not increase in the same way as magnetic field levels. Mr Geoghegan confirmed that in a non-optimised phasing magnetic field levels will increase outwards with distance from the outer conductor but at all times will be well below the ICNIRP reference level of 100 µT.

In response to a query from Dr O'Reilly as to whether the calculated levels of the electric field in this project of up to 8.0 kV/m will comply with ICNIRP 2010 guidelines, which specifies a Basic Restriction exposure level for electric field of 5.9 kV/m (Table 8.2 Volume 3B), Dr Bailey (EirGrid) confirmed that there would be compliance. He agreed that the lower level in the table is lower than the calculated strength of the electric field for this project of 7.9 kV/m. However, as Dr Bailey points out, the lower value of 5.9 kV/m is the calculated value for the spinal cord and not the CNS (central nervous system) tissue of the head. It is the CNS tissue of the head that the ICNIRP 2010 list as the crucial tissue of importance, and

when that calculation is performed, as in the case of the CNS, we get a Basic Reference exposure of 12.12 kV/m for men and 9.9 kV/m for women. Both these exposures meet the ICNIRP 2010 exposure guidelines for the general public as they are above the projected level of 7.9 kV/m directly beneath the transmission lines (Submission No 37).

Dr Bailey noted that the ICNIRP Guidelines apply in a case for the general public to *'locations where persons spend a significant amount of time'*. He stated that having a value that exceeded the basis restriction or reference level at a location where people do not spend a lot of time, would not be an exceedance of the Guidelines.

5.5.5.10. Inadequate assessment of health effects of EMF. Refusal of EirGrid to indemnify against potential health effects.

I do not accept, as stated by Dr P O'Reilly (NEPPC), that there is no objective analysis of impacts on health or that the case put forward is misleading, inaccurate and one sided. The documentation submitted provides a comprehensive overview of relevant studies carried out on ELF EMF and health, the conclusions reached and how the studies were scientifically evaluated by leading organisations in the field of health protection. It is incorrect to state that EirGrid has cherry picked reports to support its conclusions and the observers have produced no evidence to that effect. I would note that the observers tend to rely on individual studies to support their case (Reiter 1996, Draper 2005, Henshaw 2005) and have not acknowledged or relied on more recent scientific reviews or guidance from scientific agencies.

Whilst epidemiological studies have indicated a statistical relationship between long term exposure to ELF magnetic fields from power lines and a more frequent occurrence of childhood leukaemia, the assumption of a causal relationship has not been established. No relationship was found between ELF magnetic fields for all other cancers and non-cancerous diseases including cardiovascular diseases, changes in the neuroendocrine system, reproductive and developmental abnormalities or hypersensitivity.

EirGrid have clearly concluded that no health issues arise and that indemnities are not warranted.

5.5.5.11. Other Matters

The Irish Doctors Environmental Association queried the level of medical skill and qualifications available to EirGrid, noting that Dr Bill Bailey was not a medical doctor. It was also argued that due to his connections with E^{x}ponent and its reputation for protecting industry he was not sufficiently independent.

Dr Bailey's qualification and experience were set out by Mr B Murray S.C (EirGrid). Dr Bailey holds a Ph.D. in neuropsychology and currently holds the position of Principal Scientist in E^{x}ponent's Centre for Occupational and Environmental Health Risk Assessment. He confirmed to the hearing that he had extensive experience in the field of bioelectromagnetics. He is well known for his research on potential health effects of electromagnetic fields and has published papers on the subject. He was a member of the Committee that was assembled by the International Agency for Research on Cancer to review research on electric and magnetic fields at ELF frequencies and has served as advisor to numerous state and international agencies including the WHO.

Dr Bailey's contribution to the oral hearing was to provide his expert opinion on the potential health effects of exposure to ELF EMF. Health risk assessment is by its nature highly interdisciplinary and would not be confined to the field of medicine alone. It would require inputs from other disciplines such as chemistry, biology, environmental science, ecology, statistics, medicine, mathematical modelling etc., to assess and quantify the likely adverse health effects of exposure to environmental hazards. Whilst a medical doctor could make a valuable contribution, this would be limited without specific expertise/experience in the particular field.

Whilst I am not in any position to comment on E^{x}ponent credentials, I do accept that Dr Bailey has demonstrated that he is sufficiently qualified and experienced to

comment on the potential health effects of exposure to ELF EMF. I would point out to the Board that those stated to have provided consultant expertise to the observers included Professor Emeritus M J O'Carroll and Professor Emeritus Denis Henshaw. Both have worked in the field of EMF research but are noted not to be medical doctors. Dr P O'Reilly's (NEEPC) expertise is in the field of plant diseases.

I would also point out to the Board that EirGrid had the benefit of evidence from two medical doctors' Dr Gabor Mezei, who has considerable experience in the field of EMF and from Dr Martin Hogan who is also an Occupational & Environmental Health Specialist.

Mr John Rogers SC queried whether the Board could impose a condition on a grant of permission to have the dog leg section of the existing line removed extending into Woodlands station. He said this was initially planned as a straight line and subsequently diverted over Sheridan's garden. It was confirmed at the hearing that the removal of the power lines is being sought through High Court proceedings. Mr Rodgers argued the proposed development will result in additional conductors being erected on the northern side, which could give rise to cumulative effects.

The section of the line referred to by Mr Rodgers is an established part of the existing transmission system which has been in place for a considerable time. Whilst it is proposed to use the existing unused northern section of the line to link the proposed development into Woodlands sub-station, the Board does not have any jurisdiction to seek the removal of the existing line. As noted in the previous section of this report, the employment of optimal phasing along this section of the route will mitigate the potential for cumulative effects.

It was also suggested by Mr Roberts, that the hearing should be advised independently by experts on the effects of electromagnetic fields. Having regard to the substantial information available to the Board on this topic, the reviews from scientific agencies including the updated opinion from the SCENIHR (2015) and

the RIVM report commissioned by the Government and published in 2015, I do not consider that this course of action is warranted.

5.5.6. Conclusion

Ireland has adopted the ‘precautionary principle’ by adopting the internationally recognised standards and guidelines for both occupational and public exposure to electromagnetic fields.

The proposed development will be designed and operated to comply with international exposure limit guidelines for EMF as established by ICNIRP. .

Significant research has been carried and published opinions consistently find that exposures to EMF does not represent a health risk if the exposure remains below the existing limits set by the European Council’s recommendations.

There are currently no epidemiological studies published on autism to support a link with EMF.

Various studies have been carried out in different scenarios on the impacts on pacemakers and other medical devices and none suggest significant evidence of interference from high voltage lines.

Current evidence does not confirm the existence of any health consequence from exposure to ELF EMF. Similarly, there is no evidence that proximity to high voltage power lines on crop production or quality.

5.6. Construction

5.6.1. Environmental Impact Statement

The proposed construction methodology is principally described in Chapter 7 of Volume 3B[19] 'Construction'. It comprises the following main elements:

- Construction of the overhead line in five distinct phases (below). Stages 1 to 3 will be carried out as part of one contract and Stages 4 and 5 as part of a second contract, approximately one year later.
    - Stage 1. Preparatory Site Work (1-7 days). To include pre-construction site investigations, site clearance, erection of fencing around temporary working area, diversion of field drains and services and works to existing overhead lines.
    - Stage 2. Tower Foundations (3-6 days standard installation; 5-10 days piling installation). To include setting out, removal of excess material, importation of concrete and pouring of foundations.
    - Stage 3. Tower Assembly and Erection and Preliminary Reinstatement (3-4 days). To comprise the assembly and erection of towers by Derek pole (Fig. 7.8, Vol. 3B) and preliminary reinstatement of lands.
    - Stage 4. Conductor/Insulator Installation (7 days). To comprise pulling the conductor into position initially by hand (light weight pilot line) and subsequently using a puller-tensioner for a heavier steel rope and the conductor (Fig. 7.11 and 7.12, Chapter 7, Vol. 3B and Fig. 7.10, Figures, Vol. 3B).
    - Stage 5. Final Land Reinstatement (1-5 days). To include final restoration of access routes and construction areas, as close as possible to original condition.
- The erection of temporary guarding arrangements over public roads (Figure 7.1, Chapter 7, Volume 3B).
- Alterations to existing overhead lines which the proposed development traverses. To comprise the lowering of three existing 110kV overhead lines

[19] A brief over view of the construction process is also provided in Section 2.3.6 'Construction' of the Planning Report, Volume 2A.

and the undergrounding of lower voltage lines and overhead telecommunication lines in the vicinity of the proposed development (Appendix 7.3, Vol. 3B).

- Extension of the existing Woodland Sub-station by 0.544ha (to include site preparation works, erection of new fencing, excavation, installation of foundations and miscellaneous outdoor electrical equipment and lightning conductor equipment).
- Provision of a temporary construction materials storage yard to the south east of Carrickmacross, immediately west of the N2 in the townlands of Moynaltyduff and Monaltybane (Planning Drawings, MT009-001 to MT009-004).

Access to construction sites, guarding locations and stringing areas will be via the public road network and the temporary use of existing private access lanes/lands which currently provide access to property and lands within the project area. The applicant is not seeking consent for these routes but they are put forward to enable the Board to carry out its environmental impact assessment of the proposed development.

The following drawings and documents support Chapter 7 of the EIS:

- Details of line route (MT-004-001 to MT-004-072, Vol. 3B).
- Profile of towers, conductors and topography along the route (MT-005-001 to T-005-032, Vol. 3B).
- Details of foundations (MT-007-001 to MT-007-003).
- Details of towers (MT-008-001 to MT-008-008).
- Modifications to existing 110kV OHLs (MT-010-001 to MT-010-006).
- Works to Woodlands sub-station (MT006-001 to MT-006-006).
- Details of temporary construction materials storage yard (MT-009-001 to MT-009-004).
- Details of temporary access routes (Fig. 1 to 34, Vol. 3B and Fig. 13.14 to 13.17, Vol. 3C and 3D).
- Outline Construction Environmental Management Plan (CEMP) (Appendix 7.1, Vol. 3B)

- Outline Traffic Management Plan (TMP) (Appendix 7.2, Vol. 3B).
- Summary of proposed mitigation measures during construction (Chapter 11, Vol. 3B).

5.6.2. Issues raised by observers during the course of the application and during the oral hearing

Issues raised by statutory bodies, planning authorities and the public in response to the application for approval can be summarised under the following headings:

- Ground conditions - The ability of the applicant to accurately predict ground conditions for the construction of tower foundations, given the limited access granted to lands.
- The estimated volume of waste arising from the construction of foundations, temporary materials storage yard and from the extension to Woodland sub-station.
- Temporary access routes - The ability of the applicant to identify and assess the suitability of access routes, given the limited access granted to lands.
- The duration of construction works.
- The activities to take place in the works area (19mx19m) and in the working area (30mx30m).
- Nature of temporary fencing at construction sites and along access roads.
- Proposals for the storage of soils at construction sites.
- Methods to manage/protect surface water and groundwater during construction.
- Facilities for wheel washing/road sweeping during construction.
- The extent of hedgerow removal to facilitate access by construction traffic and the extent of vegetation removal required under the overhead line.
- Details regarding the construction of the temporary materials storage yard in Carrickmacross.
- Other construction details.

The applicant's response to the issues is contained in Chapter of 6 of EirGrid's submission to the Board of 19th October 2015.

5.6.3. The Oral Hearing

Construction was principally addressed in Module 1.8 of the oral hearing on 22nd March 2016 (Day 8). However, it was also referred to in Modules 1.15 (Soils) and 1.16 (Material Assets) and during Part 2 by representative groups (notably NEPPC and CMAPC) and by numerous individuals. Submissions were made by the following observers in Part 1 of the hearing:

- Esmund Keane (Senior Counsel, NEPPC).
- Michael O'Donnell (Senior Counsel, Braccanby Irish Farms & NY Irish Farms LLC).
- Dr. Padraig O'Reilly (NEPPC).
- Mary Marron and Nigel Hillis (CMAPC).

In attendance for EirGrid were:

- Brian Murray, Senior Counsel.
- Jarlath Fitzsimons, Senior Counsel.
- Mr Robert Arthur, Senior Consultant (Construction), ESBI.
- Mr Des Cox, Senior Planning Consultant, EirGrid.
- Mr Jarlath Doyle, Senior Consultant (Construction), ESBI.
- Mr Damien Grehan, Director of Energy & Environment, TOBIN.
- Mr John Dillon, Senior Environmental Engineer, TOBIN.

5.6.4. Assessment

5.6.4.1. Ground Conditions

Having regard to the limited access granted to lands, and to the absence of detailed site investigations, observers:

a. Argue that the applicants approach to site assessment is not consistent with good practice (e.g. BS 5930:2015 'Code of Practice for Ground Investigations'), and
b. Questioned whether the survey work could accurately predict ground conditions that would be encountered at individual sites, with consequences for the identification and assessment of impacts arising (e.g. foundation design, concrete required, waste arising and vehicle movements).

The EPA's Guidelines on the '*Information to be Contained in Environmental Impact Statements*' (EPA, 2002), considers that information on the receiving environment should be sufficient to facilitate the identification and evaluation of the likely significant effects of a proposed development on an environmental topic. In particular, it states that '*"Sufficiency" may therefore be regarded as enough information upon which to base a decision'*.

The Institute of Geologists of Ireland '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of the EIS'* (IGI, 2013), recommend the use of published sources of data, typically in conjunction with site investigations, to establish ground conditions. However, the report does caution that the scope of planned investigations must reflect the scale of the development, the sensitivity of the receiving environment and must be sufficient to categorise the impacts related to each relevant activity associated with the development.

Similarly, the Board's pre-application advice to the applicant was that baseline surveys should be sufficiently detailed to enable EIA to be carried out and '*If there were instances of difficulty with regard to access to land in certain areas, they should be recorded in detail in the EIS. Such detail should include the length of*

route involved and an objective assessment of how critical such denial of access is from an environmental perspective' (Record of Meeting, 2nd December 2010).

As indicated in Section 1.5 of Vol. 3B of the EIS, the applicant was able to gain access to 25% of the landholdings along the route, with 72 of the 299 tower sites subject to walkover survey (28 of the 133 tower sites in the CMSA and 44 of the 164 sites in the MSA, Section 6.1.5, Vol. 3C and 3D). Information on the ground conditions of tower sites has therefore been gathered from the walkover survey of these lands and the following sources:

- Published sources of data (including national data on sub-soils, bedrock geology, underlying aquifers and depth to bedrock at 1: 50,000).
- Vantage survey of sites from adjoining lands (On day 15 of the oral hearing, Mr Dillon stated that the applicant was able to carry out a visual assessment of a further 38% of tower sites to give a total of 63% of sites assessed by walkover survey or visually).
- High resolution aerial photography.
- LiDAR survey of a 100m corridor around the centre line of the proposed development. (I refer to the Board to Section 1.5.3 of Vol. 3B which describes this remote sensing technology in detail).

These data sources provide information on land use, vegetation, topography, geology, soils and surface and subsurface water bodies along the route of the overhead line.

During the course of the oral hearing, the applicant also clarified the following matters with regard to survey work:

- Where access was granted to lands walkover surveys had been completed together with shallow auger of soils (to 1.2m depth). Where undertaken, walkover survey and shallow augers had confirmed information gained by desk study. (On day 15 of the oral hearing, examples were given of this in respect of Towers 288 and 292).
- Had access been granted to all lands, the applicant would have carried out a walkover survey prior to planning approval and pre-construction site

investigations post approval. These pre-construction site investigations would comply with BS EN 50341, the European standard for overhead line design, and other relevant standards for ground investigations[20] (John Dillon and Robert Arthur, EirGrid, Day 15, 31 and 34 of oral hearing).

The proposed development comprises the construction of 299 new lattice steel towers (intermediate, angle and transposition towers) ranging from 26m to 51m. Foundations are dependent on tower type and ground conditions, with foundation depth (per tower leg) ranging from 2m to 3.5m and foundation area (again per tower leg) from 2m x 2m to 9m x 9m (Section 6.3.1, Vol. 3B).

The range of foundations to be used for the proposed development are shown in the MT007 series of drawings, Nos. 001-003 (Vol. 1B). The Table of Foundation Dimensions (MT007-001) indicates the minimum volume of concrete required per tower leg (i.e. standard construction) and the maximum volume of concrete per tower leg (i.e. for piled construction). This information is used in the applicant's submission No. 22 to the Board at the oral hearing to clarify the volume of concrete required in each study area by tower type and is summarised below.

In summary, an intermediate tower would typically require 26m^3 of concrete for foundation construction, in normal ground conditions, and 68m^3 in poor ground conditions (necessitating piling). Similarly, an angle tower would require between 132m^3 (normal ground conditions) and 540m^3 concrete (piling required).

[20] It is assumed that these would also comply with BS 5930 Code of Practice for Ground Investigations.

Summary of Applicant's Submission No. 22 Volume of Concrete per Tower Type.

Tower Type (piling/no piling required)	Volume of Concrete	No. of Towers of this Type
Intermediate tower (no piling)	26m^3	209 towers
Intermediate tower (piling)[21]	68m^3	13 towers
Angle tower, 30º (no piling)	132m^3	31 towers
Angle tower, 30º (piling)[22]	540m^3	1 tower
Angle tower, 60º (no piling)	244m^3	40 towers
Angle tower, 90º (no piling)	264m^3	5 towers

(NB the applicant anticipates that none of the proposed 60º or 90º angle towers require piling).

Clearly there are significant differences in foundation size with varying ground conditions and tower type. Most construction projects would not rely on desk based material alone due to the small scale of the national data sets (e.g. depth to bedrock) and local variations. Whilst the applicant has had access to 25% of lands (and oversight of 38%), site specific information has not been presented to demonstrate the robustness of the published data sources (to protect the identity of the landowner).

Given the direct interrelationship between ground conditions (e.g. need or not for piling) and environmental effects (e.g. consequential vehicle movements), this absence would appear to be significant.

Notwithstanding this, I note that the application for the interconnector in Northern Ireland, the SONI application[23], is brought forward on a similar basis, with the site

[21] Intermediate towers 104, 106, 117, 119, 120, 122, 163, 187, 269, 279, 287, 292 and 379.
[22] Angle tower No. 105 (30º).
[23] The soils, geology and groundwater section of the EIS prepared in respect of the concurrent SONI application (Chapter 9, Tyrone-Cavan Interconnector, Volume 2 – Part 1 of 2) is prepared using published sources of information and observations made during site walkovers i.e. no

assessment carried out with reference to published data sources and site walkover survey. Further, I also note that recent applications for electricity infrastructure by EirGrid or ESB Networks approved by the Board have followed similar methodologies. For instance, the assessment of soils, sub-soils and geology for the Connemara 110kV Reinforcement Project (VA0004) and the Laois Kilkenny Reinforcement Project (VA0015), was made by reference to published sources of data and site walkover survey. In the case of the Mullingar to Kinnegad 110kV Project (VA0013), the geological assessment comprised reference to published data sources, walkover survey and for soft soil, probing. In all cases detailed site investigations were carried out post approval. This approach would suggest that foundation design can be reasonably predicted from desk top research (which includes high resolution aerial photography and LiDAR) and walkover survey and is a practice which has been accepted by the Board.

In this regard I also note that during the course of the oral hearing whilst observers challenged the applicant's site specific information, no data was presented on the ground conditions of any tower site that demonstrably conflicted with the applicant's baseline data. For example, reference was made to a 'bottomless bog' in the vicinity of Towers 389/390/391. However, the applicant was able to demonstrate by way of desk top information and aerial photography that the site of the proposed towers lay on agricultural land, was traversed by agricultural machinery and lay outside of very wet land in the vicinity of the tower site[24].

Having regard to the established practice of the Board in relation to similar applications for electricity infrastructure, I would accept that the applicant has demonstrated that the extent of survey work undertaken for the proposed tower sites is sufficient to predict likely ground conditions.

ground investigations were carried out, except for the site of the proposed sub-station. Further, no information is presented on site investigations in the estimates for the movement of spoil and concrete, Annex 3, Appendix 18A Transport Assessment, Volume 3, Appendices, Part 5, Tyrone – Cavan Interconnector Consolidated ES.

[24] The applicant also pointed to an existing steel lattice tower in the same agricultural field as Tower 391 which supports the Gorman to Maynooth 220kV line.

5.6.4.2. Estimated Volume of Waste Arising from Construction of Foundations, Materials Storage Yard and Extension to Woodlands Sub-station

In the submissions to the Board and during the oral hearing the observers raised questions regarding the volume of waste anticipated to arise from the construction of the proposed development, in particular, from the foundations, the materials storage yard and from the proposed extension to the Woodlands sub-station.

Waste Arising from the Construction of Foundations

The volume of waste likely to arise from the construction of foundations is estimated by the applicant on the basis of the volume of concrete likely to be required for foundations (and therefore the volume of soil to be displaced). For the CMSA a maximum of 9,932m^3 of waste is estimated to be generated by the construction of tower foundations and in the MSA 12,098m^3.

As discussed above, I am minded to accept the information provided by the applicant on anticipated ground conditions, consequential tower types and foundation requirements. It follows, therefore, that I would also accept the applicant's estimate of waste arising. I note that the figures given are a maximum as not all waste will be removed from site, for example, top soil will be reinstated on site where possible and where practical and appropriate excavated subsoil will be used for associated construction and landscaping purposes (Section 7.3.8, Vol. 3B).

Material Storage Yard

In response to questions raised at the oral hearing by Monaghan County Council, the applicant confirmed that an estimated volume of 7,000m^3 [(25)] of waste would arise from the clearance of the proposed materials storage yard in Carrickmacross. This was accepted by Monaghan County Council.

Extension to Woodland Sub-station

On Day 16 of the oral hearing, the applicant confirmed that approximately 3,500m^3 (equivalent to approximately 7,350 tonnes) of excess soils/sub-soils would be removed off site as a result of excavation works to lower the ground level and install foundations at the proposed extension to Woodland sub-station.

Total Waste Arising

In summary, an estimated total volume of 32,530m^3 is likely to arise from site clearance works and construction of the proposed towers. Issues arising from this are discussed further in sections of this report on Material Assets – General and Material Assets - Traffic.

5.6.4.3. Temporary Access Routes

During the oral hearing, NEPPC, CMAPC and many individual landowners raised concerns regarding:

- The outdated aerial photography used by the applicant in the application documentation,
- The absence of access to lands and the ability of the applicant to identify and assess the suitability of access routes, and
- The adequacy of the proposed temporary access routes to accommodate the construction traffic associated with the development[26].

[25] On day 15 of the oral hearing, Mr Dillon, EirGrid, clarified that the 7,000 tonnes referred to in Appendix 13.8, Volume 3C, Appendices, should in fact refer to 7,000m^3.
[26] During the course of the oral hearing, adequacy of the temporary proposed access route was raised for the following towers: - No. 104, 107-110, 118-120, 123, 125-126, 128-130, 134, 135,

The concerns raised regarding the adequacy of access routes included the minor nature, inaccessibility and severe slope of some of the proposed routes, inadequate structure/width of some routes to accommodate the weight and size of construction vehicles and damage to drains, bridges and soils as a consequence of the large construction vehicles.

Other issues in respect of access routes are discussed in other sections of this report notably Legal and Procedural Issues, Human Beings – Land Use and Material Assets – Traffic.

Survey Methodology

Information on the proposed temporary access routes was gathered by the applicant from desk top survey, aerial photography, walkover survey (where access was granted) and vantage point survey. LiDAR was not used to assess the viability of access routes.

Base Maps

Proposed temporary access routes are shown in Fig. 1 to 34, Vol.3B, at a scale of 1: 5,000, on the OSi's 2005 aerial photography[27]. During the oral hearing the applicant stated that later versions of OSi aerial data printed poorly and for public presentation purposes the earlier version was used.

There is no legal impediment to the applicant using the 2005 OSi aerial photography to indicate proposed access routes. However, whilst these base maps may be more practical for reproduction purposes, their use is not ideal as data is now over 10 years out of date and does not reflect changes in land use

139, 146-148, 156, 159, 161-164, 166, 168, 170-173, 175-182, 184, 186-187, 190, 193, 212, 217, 228, 230-231, 234, 236, 237, 241-242, 260, 268-271, 274, 285-286, 333-334, 339, 346, 349, 356, 361-364, 378, 380 and 383-386.

[27] Larger scale maps of access routes have been made available to landowners, however, these do not form part of the application for approval.

over the last decade. Further, during the oral hearing it emerged that in a small number of cases, the older aerial photography provided inaccurate information on the viability of access routes (e.g. access to guarding between span 270 and 271) which was only corrected by the applicant during the course of the hearing. This matter is discussed in more detail below.

Viability and Adequacy of Access Routes

In response to the site specific concerns raised by observers regarding the viability and adequacy of each access route the applicant (a) described the applicant's approach to the use of access routes and (b) uploaded more recent, detailed aerial photography and Google street view to demonstrate the ability of a temporary access route to accommodate construction traffic. The following was emphasised in relation to the construction methodology:

- It is not the intention of the applicant to create any new entrance onto the public road but to use existing access routes, preferably those which provide direct access to lands but if necessary, via existing accesses to farm yards.
- Typically, agricultural scale equipment would be used to access construction sites (for example, using a tractor and trailer to transport bundles of steel for tower construction). However, for minor access routes or those with poor ground conditions, equipment would be scaled down to suit the nature of the access route. For example, use of a 26 tonne concrete lorry instead of 32 tonne lorry, use of a 6 tonne wheeled dumper to transfer concrete from the concrete lorry to the construction site, use of a mini piling rig where necessary (applicant's submission No. 53).
- Use of temporary matting or aluminium tracks for more sensitive access routes[28] (Type 2), or if required by landowners, with the matting or aluminium tracks laid (by the transporting vehicle) at a width to suit the width of the access route e.g. less than 4m if required.

[28] Towers 103, 104, 106, 116, 117, 119, 120, 123, 126, 130, 168, 180, 181, 182, 202, 222, 223, 229, 232 in the CMSA; and Towers 269, 279, 287, 292, 379 in the MSA.

- Use of temporary aluminium bridges to facilitate access over ditches etc. and to protect existing bridges (see visual image of bridge provided in submission No. 26 presented to oral hearing).
- Over sensitive ground, tracked, low pressure vehicles would be used to traverse sites to prevent damage to lands.
- Use of tracked vehicles to traverse steep ground.
- The assessment of temporary access routes allowed for bad weather conditions (Section 7.3.4.1.3, paragraph 42, Volume 3B). Construction sites would not be accessed in storm conditions.

For the majority of cases referred to by the observers, I would accept that the applicant was able to demonstrate a viable access to each construction site, guarding location or stringing area. For example, by identifying existing gateways at the public road, existing agricultural tracks that would be followed to access tower sites and existing gaps in hedgerows to allow access between fields. Furthermore, the applicant was able to demonstrate appropriate 'step down' equipment (as described above) for some of the minor access routes proposed and tracked equipment for some of the steep routes proposed.

Alterations to Access Routes

Notwithstanding the above, during the oral hearing the applicant brought forward a large number of changes to the proposed access routes, with 50 alterations and 23 minor deviations. These are set out in the applicant's submissions to the oral hearing nos. 1, 8, 9, 42, 50, 51, 56, 57, 58 59, 60 and 61 (and summarised in Appendix 1 of this section).

The proposed alterations are brought forward by the applicant in response to, or as a consequence of, the following:

a. Issues raised by observers, for example, to make use of existing farm tracks/existing gaps in hedgerows, to avoid banks/fences or structures (e.g. submissions No. 1, 8, 51, 56, 57, 58, 59, 60),

b. ‘Mapping discrepancies’ or ‘minor deviations’ where the mapped access point differed from the intended point (e.g. submission nos. 8, 50 and 61 to the oral hearing), i.e. the access was incorrectly identified when moved from one scale of map to another.

The alterations brought forward under ‘a’ above would suggest that the survey of access routes was in a number of cases less than robust. Whilst some of this can be explained by a lack of access to lands for survey work, in other cases it arose due to the use of outdated aerial photography and in others because aerial photography could not pick up changes in levels e.g. banks etc. Alterations brought forward under ‘b’ were generally not substantial. Whilst these were deemed to be mapping anomalies, for an application at an advanced stage these discrepancies are remiss.

Whilst the above alterations are made late in the application process, as noted in the section on Legal/Procedural Issues, the applicant is not seeking approval for the temporary access routes. They are simply presented, in an indicative manner, to enable environmental impact assessment. Within this context, the submission of alternative routes to overcome issues raised by observers in response to the application or oral hearing, is acceptable.

Furthermore, in bringing forward the alterations to proposed access routes or alternative access routes, the applicant has ultimately demonstrated a viable access route to each tower site, guarding location or stringing area for the entire route corridor. As argued by the observers, it is possible that other issues may arise which prevent use of a proposed access route e.g. a bank or wall which a landowner has not drawn to the Board’s attention. However, in these instances, the applicant’s construction methodology and principles in respect of the use of access routes can be relied on to assess any environmental effects which may arise. It is considered therefore that that the applicant has provided sufficient information in respect of access routes to enable environmental impact assessment.

5.6.4.4. Duration of Construction Works

During the course of the oral hearing, a number of observers sought clarification on the duration of construction works. This is set out in the EIS and is referred to above. In total it is estimated that the cumulative time required at any one site over the three-year construction period (i.e. Stages 1 to 5) would be 15-29 days for standard installation and 17-33 days for piling installation. Stages 1 to 3 would be carried out over a 6 to 8 week period and temporary fencing/matting etc. could be in place for this duration. This matter is discussed further in Human Beings – Land Use section of this report.

5.6.4.5. Activities to take place within Works and Working Areas

During the oral hearing the applicant clarified that (a) temporary fencing would be erected around a 30m by 30m working area, and (b) 'works would be confined to a 19m by 19m area (and c.24m x 24m in the vicinity of angle towers), as indicated on the planning drawings (MT-004-001 to MT-004-072).

Within the 19m by 19m works area, foundations would be excavated and poured and top soil stored (for restoration of the site). Working arrangements are supported by the following illustrations submitted at the oral hearing:

- Submission No. 26 - Illustrates the extent of the 30m x 30m working area around an existing steel lattice tower.
- Submission No. 25 - Indicates silt control measures within the works area.
- Submission No. 66- Indicates the layout of the working area on a steep site (tower site 166).

These matters are explored further in the section of this report on Human Beings – Land Use.

5.6.4.6. Nature of Temporary Fencing at Construction Sites and along Access Roads

Section 7.3.4.1.2 of Vol. 3B refers to the erection of temporary fencing to delineate any on-site working area. During the course of the oral hearing, the applicant clarified that temporary Heras Fencing (submission No. 26) would be used around the construction sites and that typically electric fencing would be used, if required

by the landowner, along temporary access routes. Fencing would be in place for 6 to 8 weeks during stages 1 to 3 of construction.

This matter of temporary fencing is discussed further in the Human Beings – Land Use section of this report.

5.6.4.7. Proposals for the Storage of Soils at Construction Sites

Monaghan County Council raised concerns regarding the storage of soils on construction sites, maintaining that there was insufficient site specific information on volume to be stored, which could give rise to silt discharge.

In response the applicant clarified that the majority of soils would be removed from site with a limited quantity retained for site restoration purposes. The soil remaining on site would be stored for the duration of foundation works, typically 3 to 6 days. Mineral soils would be stored at less than 2m and peat soils at less than 1m. Peat soils would be stored under the supervision of a geotechnical engineer and in adverse weather conditions geotextile matting would be placed on top of the stockpiles to contain the peat.

The applicant's submission No. 66 illustrates the layout of a construction site works area on a steep slope. It indicates soil storage areas, silt curtains and the foundation area.

This matter is discussed further in the Water section of this report.

5.6.4.8. Methods to Manage/Protect Surface Water and Groundwater during Construction

During the oral hearing observers raised concerns regarding the means to manage surface water at construction sites and the facilities for washing out concrete lorries and dumper trucks.

In response, the applicant referred to mitigation measures set out in the EIS, summarised in the outline CEMP (Appendix 7.1, Vol. 3B), in Chapter 11 (Summary of Mitigation Measures) of Vol. 3B and confirmed the following:

- Silt curtains would be used within the 19m x 19m works area and outside of this in the working area (submission No. 25).
- Flow would be diverted upslope of construction sites and silt curtains would be used downslope to prevent sediment laden runoff.
- In Co. Monaghan, and elsewhere where ground conditions were very steep a double silt curtain would be used.
- Washing out of concrete lorries would be carried out at a licenced facility or at the materials storage yard. Wash out of dumper trucks could be carried out on site, with water to controlled skip for off-site disposal.

This matter is discussed further in the Water section of this report.

5.6.4.9. Facilities for Wheel Washing/Road Sweeping during Construction

During the oral hearing observers raised issues regarding the facilities that would be put in place for wheel washing and road sweeping.

Reference is made in the outline Traffic Management Plan (Appendix 7.2, Vol. 3B) to road cleaning and vehicle cleaning which will require the main contractor to (a) carry out road sweeping operations to remove any project related dirt or material deposited on the public road, and (b) to provide wheel washing facilities, and any other necessary measures, to remove mud and organic material from vehicles exiting tower sites.

During the oral hearing the applicant clarified that it would be for the contractor to identify site specific arrangements for the location and means of wheel washing e.g. within working area, prior to joining the public road, by mobile wheel wash, wheel brushing etc. These arrangements are consistent with typical construction practices, are acceptable in principle and reflected in the outline TMP.

This matter will be discussed further in other sections of this report, namely Material Assets – Traffic, Water and Human Beings – Land Use.

5.6.4.10. The Extent of Hedgerow Removal to Facilitate Access by Construction Traffic and Woodland and Vegetation Removal Required under Overhead Line

Hedgerow Removal to Facilitate Access

As stated in Section 7.3.4.1.2 of Vol. 3B of the EIS and as re-iterated at the oral hearing, there may be a requirement for the trimming or loss of localised vegetation along temporary access routes. I note that given the use of existing access routes, the extent of trimming should not be significant. Further, any localised losses (e.g. required to facilitate access between fields) will be reinstated.

Vegetation Removal under OHL

The extent of permanent woodland, tree and vegetation removal underneath the overhead line is set out in Section 7.3.4.1.2, Vol. 3B. It includes a worst case scenario provision of a clearway corridor of up to 74m on either side of the line, but with the level of trimming directly related to the height of vegetation and distance from the overhead line, with a resultant scalloping or profiling effect on vegetation. As stated in the EIS (Section 6.5.2.1.3, Volume 3C and 3D) and as reiterated by Daireann McDonnell (EirGrid) at the oral hearing, this level of impact will be reduced at the design stage, in consultation with the landowner, and will only be carried out where required.

Felling of Woodland

I note that the construction methodology proposes trimming and lopping of woodland by tree surgeons by hand, with no requirement for machinery. Similarly, for plantations, these would typically be clear felled by hand with felled trees left on site. During the course of the oral hearing the applicant clarified that if the landowner so wished felled timber (particularly mature woodland) could be moved off site. However, the applicant presented no information on the volume of traffic movements arising as a result of the removal of trees (e.g. Brittas Estate) or the means to access lands for same (e.g. felling in plantations in the vicinity of Tower 246 and 248 and felling in the Brittas Estate in the vicinity of the southern entrance) but did state that it would be possible to cut felled timber to a manageable size for removal by hand[29].

These matters will be discussed further in other sections of this report, namely Ecology, Landscape and Traffic.

5.6.4.11. Details regarding the Construction of the Temporary Materials Storage Yard in Carrickmacross

Details of the proposed construction materials storage yard are shown in Planning Drawings MT-009-001 to MT-009-004, Volume 1B. These include details on site layout, arrangements for the disposal of surface water, storage of materials and perimeter fencing. During the oral hearing the applicant clarified that c.10cm depth of top soil would be removed from the site prior to its use, giving rise to c.7,000m^3 of waste material to be disposed of. Upon completion top soil would be imported to the site.

Monaghan County Council raised issues regarding the external appearance of the compound. This matter was not addressed by the applicant, but should the Board be minded to grant approval for the development, this could be addressed by condition.

[29] Comments made by EirGrid in reference to Brittas Estate.

5.6.4.12. Other Construction Details

During the hearing, the applicant also clarified the following construction matters:

- In accordance with advice given by the Board (pre-application meeting, December 2013) an outline construction management plan had been prepared to accompany the application for approval.
- The proposed towers would not be used to support telecommunications equipment and there was no requirement to put navigational aids on towers.
- The overhead line had been designed to achieve an adequate vertical clearance and appropriate standard for ice loading (standard EN 50341-1 *Overhead electrical lines exceeding AC 1 kV. General requirements. Common Specifications*) and would be monitored on an on-going basis for compliance with standards (including creep).

5.6.5. Summary and Conclusion

The key issues arising in this section of the report relate to the ability of the applicant to predict ground conditions and assess the viability of access routes, based on the limited access to lands for survey.

It is considered that the applicant has demonstrated that the use of primarily desk top survey work (which includes LiDAR survey), supplemented by walkover survey, shallow augers and vantage point survey where possible, is consistent with the approach taken by the applicant in respect of other electricity transmission projects in the State and is sufficient to predict ground conditions for the design of foundations.

It is noted that the methodology adopted in respect of the proposed access routes (which was not subject to LiDAR survey) has resulted in alterations to access routes during the course of the oral hearing. As the applicant is not seeking approval for the proposed access routes, it is considered that this approach is acceptable. Furthermore, it is considered that the applicant has demonstrated a viable access route to each tower site, guarding location or stringing area for the entire route corridor and has set out clear principles regarding the proposed use of

access routes for environmental impact assessment, should the indicative routes change.

The remaining technical sections of this report assess the environmental effects of the indicative access routes and the environmental effects of the proposed construction methodology for the use of these.

Appendix 1 (Section 5.5)
Alterations Table in Respect of Access Routes to Towers, Guarding Locations or Stringing Areas

ABP Submission Number (Date)	Tower/Guarding/Stringing Area Affected
Overview of North South 400kV Interconnection Development, submission No. 1 (7th March 2016)	Alternative temporary access routes to: • Tower 123 • Tower 135 • Tower 137 • Tower 139 • Tower 159 • Tower 191
Module 1.8 Modified Access Routes, submissions nos. 8 and 9 (22nd March 2016)	• Tower 127 • Tower 136 and guarding • Tower 142 • Tower 153 • Tower 206 and 207 (guarding) • Tower 210 • Tower 211 • Tower 227 • Tower 230 • Stringing area tower 242 • Guarding between tower 251 and 252 • Tower 258 • To guarding and stringing area tower 322 • Tower 338 and guarding area • Tower 347/348 • Tower 358 and guarding • Tower 364 • Tower 365 • To guarding 380
Temporary Access Road to Local Road (Tower 337), submission No. 42 (19th April 2016)	Extension of temporary access road to public road (tower 337)
Schedule of Minor Deviations, submission No. 50 (26th April 2016)	Minor deviations to the following accesses: • 110 • 212 and guarding to north • 134

	• 137 • 146 • 149 and 150 • 154 • 159 • 164 • 176 • Stringing south of 176 • 183 • 192 • Guarding between 199 and 200 • 214 and 215 • 224 • 225 • 234 • 236 • 406/407 guarding • 249/250 guarding
Modified Access Routes April 2016, submission No. 51 (26th April 2016)	Alternative temporary access routes to: • Tower 109 • Tower 126 • Tower 249 • Tower 277 • Tower 289 • Tower 349 • Tower 400 • Tower 170 • Guarding south of road, span 150-151 • Tower 175 • Guarding north of road, span 185-186 • Tower 250 and guarding • Tower 254 and guarding • Tower 261 • Tower 305 • Tower 308 • Tower 351 and 352
Modified Access Routes May 2016,	Alternative temporary access routes to tower 189

submission nos. 56 and 57 (10th May 2016)	and stringing area for tower 188.
Modified Access Routes May 2016, submission nos. 58 and 59 (10th May 2016)	Tower 146
Alternative Access Route, submission No. 60 (10th May 2016)	Alternative temporary access routes to: • Tower 177 • Tower 179 • Guarding spanning 270 to 271 • Tower 356
Schedule of Minor Deviations submission No. 61 (10th May 2016)	Amendment to submission No. 50 with the addition of access route to Tower 191.

5.7. Human Beings – Population and Economic

5.7.1. Environmental Impact Statement

Population and socio-economic issues are principally dealt with in Chapter 2 of Volumes 3C and 3D of the EIS. Also relevant are:

- Chapter 4 which deals with Human Beings – Tourism and Amenities (these issues are addressed in a separate section this report).
- Section 5.2.2 of the Planning Report (Vol. 2A) which addresses the impact of the development on land and property values and explains the applicant's approach to community gain.

Chapter 2 describes the existing environment in Monaghan, Cavan and Meath, including population trends, settlement patterns, employment and economic activity. For both the CMSA and MSA, the EIS concludes that:

- The development has been sited to maximise the distance between the proposed development and urban centres, local villages, clustered settlements, individual one-off houses, schools, churches and community facilities.
- Impacts on these receptors, during construction and operation, have been evaluated in the various specialist chapters of the EIS. The main impact on residential amenity arises from the visual impacts, where dwellings are located in close proximity for the proposed development.
- The landscape and visual resources of the wider CMSA and MSA will not deteriorate to a significant degree.
- The development (construction and operational phases) will have no noticeable impact on population demographics.
- The development will result in some positive local economic benefits with the provision of direct and indirect jobs and the purchase of construction materials (with the sourcing of standard materials locally where possible).
- When operational the development will contribute towards (a) ensuring that the grid is not a barrier to further significant investment in employment generating activities and (b) wider economic benefits arising from the

improvements to the electricity grid in the island of Ireland which will be experienced in both jurisdictions.

A short section of the proposed development passes through a small Gaeltacht area. The EIS states that the proposed development is not of a type to significantly adversely impact on the linguistic or cultural heritage of the area or on the promotion of Irish as the community language.

5.7.1.1. Land and Property Values

Section 5.5.2 of the Planning Report (Volume 2A) states that, in accordance with the EPA's guidance on the preparation of environmental impact statements, the EIS does not address the issue of property value or devaluation per se. Instead, environmental impacts are considered and evaluated which may be identified as having a potential influence on the amenity of property. Paragraph 48 states '*it is for the Board to assess whether any potential devaluation of property may be relevant to the decision-making process to be undertaken by the Board in its consideration of the proposed development'.*

Notwithstanding the above, Section 5.5.2 of the report explores the relationship between existing OHL infrastructure in Ireland and property values and potential implications arising for the proposed development. It refers to international research, much of which is carried out in North America and Canada, which is not supportive of significant negative impacts on residential property values and states, in respect of farms, that there is practically no evidence to suggest that the value of farms would be affected by the presence of high voltage OHL infrastructure. The report summarises observations from the research including:

- *Where negative impacts were found, the impact of towers was larger than the impact from transmission lines, thus emphasising the visual component;*
- *Where an impact was found the effect diminished rapidly with distance from the high voltage OHL infrastructure. In this regard, the impact of the high voltage OHL infrastructure disappears within the region of 150-200m with the maximum impact at even closer distances;*

- *Greatly increased media coverage of health issues from 1992 onward does not appear to have had any major impact on research findings post 1992 compared to pre 1992;*
- *Proximity to high voltage OHL infrastructure is just one of a complex mix of variables all of which are always assessed and weighted by purchasers, such as quality of land, proximity to family, proximity to community facilities etc.;*
- *Where negative impacts were found they generally decrease with the passage of time and in some cases had faded away after ten years; and*
- *Properties close to high voltage OHL infrastructure appreciate at the same rate as properties located away from high voltage infrastructure.*

The report concludes that in some specific situations there may be possible low level negative impacts on property prices for residential property in immediate proximity to the proposed development, but that these impacts will likely diminish greatly or disappear completely over time after the construction period. Farmland prices are not expected to be affected at all.

5.7.1.2. Community Gain

Section 5.5.3 of the Planning Report (Vol. 2A) describes the applicant's community gain mechanism which provides:

- €40,000 per kilometre for communities in proximity to the proposed development.
- A once off *ex-gratia* payment to owners of residential property (or sites with planning permission) within 200m of the development, with €30,000 for residences at 50m from the centre line of the development, decreasing on a sliding scale to €5,000 for residences at 200m.

5.7.2. Policy Context

Policies of all three plans support the development of the local economy, with specific policies in respect of agriculture (including agri-tourism), forestry, tourism and rural enterprises. Relevant policies and objectives of the respective development plans include the following:

- Monaghan County Development Plan 2013 to 2019 – AGO2-AGO6, FYO2, INO2-INO4, TMO1-TMO17.
- Cavan County Development Plan 2014 to 2020 - EDP3 to EDP7, EDO9, EDP5, EDP11-12, RT policies.
- Meath County Development Plan 2013 to 2019 - ED policies, RD Pol 10 and 12, RD Pol 15, ED Pol 27, 28, 29 and 31 and ED Pol 14.

Similarly, social development policies of the three plans support the development of community and recreation facilities within the counties. Relevant policies and objectives include the following:

- Monaghan CDP - CIO2-6 and RAO2.
- Cavan CDP - SCP 14.
- Meath CDP - SOC POL 33.

In addition, the Meath County Development Plan supports the government's objective to protect and promote the linguistic and cultural heritage of the two small Gaeltacht areas in the County through the following strategic goal '*To ensure the continued survival and development of the Gaeltachts as an area distinct in the linguistic and cultural life of the county, whilst seeking to realise their economic and development potential in a balanced and sustainable manner over the lifetime of the Plan'.*

5.7.3. Issues raised by observers during the course of the application and during the oral hearing

The main issues raised by observers may be summarised as follows:

- Impact of development on land and property values.
- Impact on the development potential of land and property.
- ESB/IFA Code of Practice.
- Issues regarding community gain.
- Impact on population demographics.
- Inadequate assessment of true cost of project.
- Social acceptance of development.
- Impact on businesses/local economy.

- Impacts on rural activities, community facilities and community events.
- Impact on Gaeltacht.

The applicant's response to the issues raised is contained in Chapters 2 and 9 of their submission to the Board of the 19th October 2015.

5.7.4. The Oral Hearing

Population and Economic issues were principally addressed in Module 1.10 on 24th March 2016 (Day 10) of the hearing. Issues were also discussed in Module 1 (Land Use) and during Part 2, notably in Modules 2.1 (Elected Representatives), 2.3 and 2.4 (Specific Landowner and Public Issues). Impact of the development on the Gaeltacht was discussed on 3rd May 2016 (Day 27). Submissions were made by the following observers in Part 1 of the hearing:

- Paidraig O'Reilly, NEPPC.
- Aimee Tracey, NEPPC.
- Nigel Hillis, CMAPC.

Submissions in respect of the Gaeltacht were made by the following individuals:

- Uinsionn O'Gairbhi.
- Cathal Seoighe.
- Máire Nic an tSithigh.

In attendance for EirGrid were:

- Jarlath Fitzsimons, Senior Counsel.
- Tom Corr, Chartered Valuation Surveyor and Agronomist.
- Professor Cathal Walsh, Chair of Statistics, University of Limerick and member of Insight Statistical Solutions.
- William Mongey, Senior Engineer, Grid Development, EirGrid.
- Brendan Allen, Senior Planning Consultant, ESBI.

5.7.5. Assessment

5.7.5.1. Impact of development on land and property values

Numerous observers draw the Board's attention to their concerns regarding the impact of the proposed development on the value of land and property. Observers dispute the relevance of the North American research referred to by the applicant. They refer the Board to opinions and studies supporting their view that the proposed development has had and will have an adverse impact on land and property values. In this regard, I draw the Board's attention to Appendix 23 of NEPPC's submission to the Board which includes a report prepared by Lisney (Chartered Surveyors and Property Consultants) in respect of the previous oral hearing.

In addition, a number of parties referred to specific instances where sales of property or land had been affected by the proposed development[30], or valuations had been reduced as a consequence of same[31] and a large number referred to their concerns that their land/property would be devalued as a consequence of the development and/or that they would not be able to sell the property/land[32].

[30] James Languish (in proximity to tower 386), sale fell through when purchaser advised lands would be affected by proposed development; Leo Marron (near tower 157) left details with estate agent – no interest in lands.

[31] Cyril Darcy (near tower 343) advised farm would be devalued by 50%; Maria Fitzpatrick (near tower 104) advised value of property would fall from €200,000 to €160,000; Alan McAdam (near tower 190-194) was advised that property would be devalued; Brendan Markey (neighbours lands near tower 155) value fell from €240,000 to €170,000; Joseph Clarke (lands near towers 339-341), advised that value of farm would fall by up to 50%.

[32] Maria Fitzpatrick (T104); Maria McKenna (T109); Ann & Pat Murray; Arlene & Vincent Brennan, Matthew Gorman & family (T116); Noel & Martin McGarrell & Nigel Donaldson (T118-122); John McGuiness (T123/124); Ciaran Kerr (T123-125); John Hughes (T130); Doohamlet and District Development Association; James Rice (T128-129); Roy Brown (T131); Philip McDermot (T133); Enda & Rose Duffy (T134); Irene Steenson, Trevor & Linda Field (T142); Barry Duffy (Doohamlet NS); Charlie Mulligan (T146); Clare Reilly (T149/150); Sean Duffy (T149/150); Brendan Markey (T155); Bernard/Gabriel Mooney (T156/157); Leo Marron (T157); Dominic Hart (T162); Pauric Connelly (T165); Pauric Agnew (T165/166); Owen & Helen McCabe (T178/179); Des Marron (T177); Mary Marron (T182); Jimmy Marron (T183-184); Paul Keenan (T186); Jim Coyle (T170); Alan McAdam (T190-194); Sean Lynch (T190-191); Philip Freeman (T191); Paul & Eugene Russell (T192); Francis Clarke (T194); James Hannigan (T196-199); Kevin Sheils (T227); Charles Clarke (T228); Aiden Finnegan (T260); Donal McKeever (T273-5); Philip Ward (T308); Denis Nixon (T315); Sandra Coffee (T316); Ron & Roisin Pagan (T330); Maria O'Neil (T341); Tom Madden; Cyril Darcy (T343); Diarmuid Lally (T356-357); Brendan Bagnol (358-359); Brendan Martin (T360-364); Stephen McCormack (T379); Mr and Mrs Dahaene (T383-385); James Languish (T386).

Inclusion within EIA

Current guidance on the preparation and contents of an EIS are provided by the EPA[33]. I note that the EPA's Guidelines on the Information to be Contained in EIS, state that, with reference to achieving effectiveness and efficiency, *'Matters such as landuse planning, employment, economic, financial or health considerations are* [my emphasis] *of relevance but only insofar as they are physically manifested at, or directly adjacent to, the development site.'*

During the oral hearing, Mr Fitzsimons for EirGrid referred the Board to the decision of the European Court of Justice's on whether Article 3[34] of the EIA Directive (Leth v Republic of Austria, C-420/11, March 2013) applies to the pecuniary value of material assets and their conclusion that that the EIA provided for in Article 3 of the directive '*does not include the assessment of the effects which the project under examination has on the value of material assets.'*

I note that the Court's ruling goes on to state '*However, pecuniary damage, in so far as it is the direct economic consequence of the effects on the environment of a public or private project, is covered by the objective of protection pursued by Directive 85/337'. [*My emphasis*].*

It would appear to me therefore that (a) the EPA's guidance provides some scope for the consideration of impacts on property and land values within the process of environmental impact assessment, and (b) the European Court of Justice's ruling would suggest that any financial penalty occurring as a consequence of the environmental effects of the development would also fall within the overall objective of the Directive.

In this instance, the matter of devaluation is of significant public interest and I consider that it is appropriate for the Board to have regard to it in their decision

[33] Advice Notes on Current Practice in the Preparation of EIS (EPA, 2003), Guidelines on the Information to be Contained in EIS (EPA, 2002).
[34] Which requires the identification, description and assessment of the development on different aspects of the environment, including material assets.

making process. Given that any impact on valuation is a secondary effect i.e. it will be driven by other environmental effects such as the visual impact of the development, perceptions of impacts on health etc., the Board may wish to consider these matters in the first instance but have regard to impacts on land and property values in the process of environmental impact assessment. Within this context, I make the following comments:

Effects on Land and Property Values

I note the applicant's reference to the body of international research in respect of the impact of high voltage overhead power lines on residential property values and agricultural land. However, most of this research was carried out in North America and it is not clear from the information provided how it relates to this Irish context, for either residential development or agricultural. For example, the pattern of small farms in County Monaghan, Cavan and Meath would appear to be at odds with the large scale farming practices of North America.

During the oral hearing, the applicant also made reference to the following research commissioned by the applicant: '*An Investigation into the Potential Relationship between Property Values and High Voltage Overhead Transmission Lines in Ireland'* (EirGrid, 2016)[35].

The purpose of the study was to present a framework to better assess the potential impact, if any, of high voltage overhead transmission lines (HVOTLs) on the value of properties in close proximity to overhead electricity transmission infrastructure. It comprised three elements (a) a literature review, (b) a survey of the view of estate agents in the State regarding their professional view on the impact of high voltage overhead lines on property values, and (c) statistical analysis of impact of overhead lines on property values.

The report concluded that:

[35] Available from: http://www.eirgridgroup.com/site-files/library/EirGrid/FINAL-Part-1-Property-Valuation-Report-Doc.-Version-1.0-23.02.16.pdf [Accessed 16th September 2016].

1. Estate agents generally considered HVOTLs to have a negative impact on residential property values and agricultural land, *'The agent's opinions of negative impact from HVOTLs on residential property in the survey part of this research were 3%, 13% and 20% for 110 kV, 220 kV and 400 kV respectively'.*
2. Statistical analysis of sales data did not find a statistical significant negative impact from HVOTLs in close proximity to either residential or farm properties.

I note that the dataset used in the research (Table 6.2 of the report) refers to a total of 503 residential properties sold in proximity to twin poles, pylon or angle masts associated with 110kV, 220kV and 400kV OHLs. However:

- A small number of properties lie within 250m of twin poles or pylon/angle masts (i.e. 21 properties within 150m and 22 properties within 151-250m of twin poles or pylon/angle mast),
- The vast majority of the properties, 460 of the 503, lie more than 250m from twin poles, pylon or angle mast with the average distance to the nearest structure 764m (752m to pylons/angle masts).
- Of the 503 properties assessed, only 6 no. lie in proximity to a 400kV OHL structures.

Similar issues arise in respect of the dataset for agricultural land.

In the applicant's Residential Visual Impact Assessment (RVIA), Appendix 11.2, Vol. 3C and 3D, it is concluded that significant visual effects will occur for residential property lying within 500m of the proposed development. Furthermore, it is evident form the maps accompanying the RVIA that the most significant impacts occur for properties in close proximity to the development, typically less than 200m.

In view of these factors, notably the distance of properties from OHL infrastructure and the very small number of sales of property in proximity to 400kV OHLs, I am not confident that the report's conclusions are relevant to the proposed development.

Notwithstanding the above, during the oral hearing, Tom Corr (Chartered Valuation Surveyor, Agronomist) on behalf of the applicant accepted that in some specific situations there may be possible low level negative impacts on property prices for residential property in immediate proximity to the proposed development (this point is also accepted in the Planning Report). This argument was not accepted in respect of agricultural land, primarily due to the multiple variables considered by potential purchasers of land and the small volume of landholdings coming forward for sale.

In the Landscape and Visual Impact assessment of this report, it is concluded that the proposed development is likely to give rise to significant visual effects particularly for properties in close proximity to the line. It would seem that in these circumstances, the visual impact of the proposed development could reasonably reduce the number of parties interested in a particular property or the value that is placed on it. Similarly, any perceptions regarding the potential health effects of the development could reduce the number of interested parties or the relative value placed on a property.

Therefore, whilst I would accept some of the arguments put forward by the applicant, including that the effects of the proposed development may diminish over time and certainly with distance from the development and with screening vegetation or topography, it is difficult to accept any argument that the significant visual effect of the proposed development, where it arises, does not affect, to some degree, residential property values and/or ability to sell. With regard to agricultural land, I would consider that the same issues apply, but having regard to the multiplicity of factors which may influence the sale of agricultural land and the small volume of landholdings coming onto the market, possibly to a lesser extent.

5.7.5.2. Impact on Development Potential of Land and Property

Third parties draw the Board's attention to the impact of the proposed development on the development potential of land and property in its vicinity. For example, the effect of the development on the ability of landowners to provide sites for their children, to sell sites, or to develop land or property in proximity to OHL (e.g. for tourism, agri-tourism)[36]. Parties refer to the consequences of these effects, for example, the ability of farmers to fund their retirement/future care, the burden on title deeds, and the loss of future inheritance for children.

During the application for approval and oral hearing, the applicant argues that the proposed development does not result in sterilisation of lands i.e. that there is no statutory restriction in relation to development in proximity to overhead lines. This position is reflected in ESB/IFA Code of Practice[37] which refers to the statutory requirement to inform ESB if it is the landowner's intention to erect a building or structure within 25 yards (23m) either side of any transmission wire.

Whilst I accept therefore that there is no statutory impediment to building in proximity to overhead line infrastructure, having regard to my view that, in certain circumstances (above), the proposed development may have a negative impact on property prices and ability to sell, I would accept that in similar circumstances the proposed development may impact on the development potential of land and/or property in the vicinity of the route.

However, in this instance I refer the Board to the provisions of the ESB/IFA Code or Practice which clearly makes provision for the alteration of the overhead line or compensation if the line interferes with any future viable development of lands (and formal arbitration in the event that agreement cannot be reached). Having regard to these provisions, I do not consider that the proposed development will

[36] Brendan Bagnol, Noel & Martin McGarrell, Nigel Donaldson, Ciaran Kerr, Paedar McSkeane, Denis Nixon, Philip McDermot, Owen & Helen McCabe, Ann Irwin, Jimmy Marron, Paul Keenan, Pauric Agnew, Eugene Russell, France Clarke, Philip & Linda Connelly, Sean Duffy, Brendan Markey, Leo Marron; Eugene O'Reilly (brother of); Charles Clarke; Hugh Finnegan.
[37] ESB/IFA *Code of Practice for the Survey, Construction & Maintenance of Overhead Lines in relation to the Rights of Landowners* (ESB International, 1985).

give rise to significant impacts on the development potential of land or property in the immediate vicinity of the route.

5.7.5.3. ESB/IFA Code of Practice

Third parties question the current relevance of the ESB/IFA *Code of Practice for the Survey, Construction & Maintenance of Overhead Lines in relation to the Rights of Landowners* (ESB International, 1985), and its application to non-IFA members and to tenants.

The ESB/IFA Code of Practice was drawn up between the ESB and the IFA in 1985 as guidelines for the various activities associated with the survey, construction and maintenance of overhead lines of 110kV and above. The Code of Practice applies to both landowners and occupiers of land[38]. Whilst the Code of Practice was adopted over 30 years ago the applicant stated during the oral hearing that its provisions remain relevant today and are used in the in the planning and development of the transmission system infrastructure. Having regard to its widespread use in applications coming before the Board, I would accept this position. In addition, the Code of Practice makes reference to a formal arbitration process if agreement cannot be reached between the parties and in this regard I would accept that it forms an appropriate basis for discussion, negotiation and agreement with all landowners regardless of their membership of the IFA.

5.7.5.4. Issues Regarding Community Gain

Observers argue that the community gain offered by the applicant is inadequate to offset the effects of the development, for example, to offset the loss of value to a property, to enable owners to sell their property and buy elsewhere, to compensate for impacts on the landscape. Some parties argue that is should be offered to all properties within 800m of the development as the impacts of the development are widespread.

Section 182(B)(6) of the Planning and Development Act 2000 (as amended) enables the Board to attach conditions in respect of the provision of a community

[38] Jarlath Fitzsimons, EirGrid, day 32 of oral hearing.

facility or service, in the area of the proposed development, that would constitute a substantial gain to the community.

As stated, Section 5.5.3 of the Planning Report (Vol. 2A) sets out the applicant's approach toward community gain. For residential property it comprises *ex-gratia* payments, on a sliding scale for properties within 200m of the centre line of the proposed development. (During the oral hearing the applicant also stated that for properties less than 50m of the OHL these would be dealt with on a case by case basis with a specific proximity payment or purchase of the property[39]).

For the proposed development I note that 298 properties fall within 200m of the centre line of the proposed development, broken down as follows:

- 2 residential dwellings within 50m (both located along the existing Oldstreet to Woodland OHL),
- 69 residential dwellings within 50-100m (with 7 no. located along the existing Oldstreet to Woodland OHL),
- 103 residential dwellings within 100-150m, and
- 124 residential dwellings within 150-200m.

In addition, as indicated in the RVIA a further 772 properties lie between 200m and 500m of the proposed development[40].

As discussed in other sections of this report, the significant effects of the development, notably visual impact and concerns regarding the health effects of the development, occur most significantly in close proximity to the proposed development and decline with distance from it. Therefore, I consider that the proposed mechanism of sliding payments, with distance from the development, is appropriate in principle. The Board may wish to consider if payments should extend over a wider area, however, given that predicted impacts are likely most significant in close proximity to the line, any payments, in my view, should be targeted here.

[39] William Mongey, EirGrid, day 21 of oral hearing.
[40] In total 1,070 properties fall within 500m of the proposed development (MSA, CMSA and NI).

Previously in this section I have accepted that the proposed development may give rise to impacts on property values/ability to sell. However, any such impacts are likely to be highly site specific, debateable and difficult to quantify. Furthermore, the proposed payments are not offered as a consequence of impact, be that visual, perceived health or financial. (By definition the *ex-gratia* payments are gifted or given as a gesture of goodwill).

Within this context I consider that the proposed proximity payments (and community payments) are therefore a reasonable attempt by the applicant to address some of the potential impacts of the development in the community in which they occur. The administration of the community gain fund can be controlled by condition.

5.7.5.5. Impact on Population Demographics

The observers raise concerns regarding the impact of the development on future demographics, for example, if 'sterilisation' along the route corridor results in a decline in people living in the area, with consequences for local schools and community facilities.

The proposed development comprises a linear project with a modest land take, affecting a relatively narrow corridor through County Monaghan, Cavan and Meath. Furthermore, significant environmental effects, arising as a consequence of the development, are generally confined to the immediate vicinity of the proposed development. Consequently, any adverse impacts on population (if they arise) will occur over a small geographical area and are unlikely to give rise to significant impacts on population demographics.

5.7.5.6. Inadequate Assessment of True Cost of Project.

Observers argue that the applicant has not provided an adequate assessment of the true cost of the project. In particular, they state that the applicant's cost estimates and comparison with alternatives exclude any reference to wider costs,

including land and property de-valuation, which will occur as a consequence of the development. This matter is addressed in other sections of this report.

5.7.5.7. Social Acceptance of Development

In submissions made in respect of the application for approval and during the oral hearing, observers made repeated calls for the development to be placed underground, in particular in view of the perceived health effects of the development, land and property devaluation and landscape and visual effects. In particular, they draw the Board's attention to the lack of social acceptance of the project in its current form.

This report aims to assess the likely impacts of the development on the environment, including people who live and work in the vicinity of the route. However, it is acknowledged here, and drawn to the Board's attention, that the proposed development:

- Has attracted substantial opposition throughout the three counties of Monaghan, Cavan and Meath from individuals, community groups, interest groups and elected representatives, and
- There is a demonstrable lack of social acceptance of the development in its current form.

5.7.5.8. Impact on Businesses/Local economy

The observers draw the Board's attention to the impact of the development on local businesses e.g. a healing practice, wind turbine, music school, equipment hire business, boarding kennels. Impacts of the proposed development on land uses is considered in a separate section of this report. It is noted that the land uses referred to above will not be directly affected by the development. Whilst I accept that the music school and equipment hire business at Churchtown House lie to the west of the OHL, they are removed from it (c.140m). Having regard to this, I would not anticipate any significant impacts to arise as a consequence of the development on this business, the others referred to, or therefore on the local economy due to impacts on businesses.

5.7.5.9. Impacts on Rural Activities, Community Facilities and Community Events

The observers argue that the proposed development will adversely impact on outdoor pursuits/rural events occurring in the vicinity of the proposed development (including income arising from these) and on the use, and therefore the viability of, community facilities, for instance:

- Hunt, cycling and angling clubs,
- The GAA Centre of Excellence in Dunganny, and community facilities in towns and villages close to the route such as Ballybay and Kingscourt, and
- Community events e.g. Dunderry Fair, the Fair of Muff.

Outdoor Pursuits/Rural Events

The impact of the development on visitor attractions and community events is dealt with under Tourism and Amenity in this report. It is considered, in this section, that the proposed development is routed away from the region's main tourist attractions and consequently will only have an adverse impact on a small number of local visitor attractions and the character of the local landscape in the immediate vicinity of the route.

Within this context, it is likely that the development will also detract to some extent from the amenity of the countryside which hosts local outdoor activities for the local community and tourists, for example, walking, angling, cycling and agri-tourism. However, as stated in the section on Tourism and Amenity, the proposed development is confined to a narrow physical corridor and it is unlikely that it will have a significant impact on outdoor pursuits or rural events in the wider area of the County Monaghan, Cavan or Meath.

Community Facilities

Chapter 2 of the EIS (Vol. 3C and 3D) identifies community facilities within 1km of the route as follows:

CMSA

- Drumhowan Gaelic Athletic Association (GAA) club (c.330m east of Tower 150),
- Laragh National School and Church (c.410m east of Tower 230),
- Corcreeghagh National School (c.640m west of Tower 195),
- Ballintra Church (c.750m south-west of Tower 142), and
- Ballaghnagearn National School (c. 820m south-east of Tower 207).

MSA

- Oristown Church (c.150m west of Tower 302 and 303), and
- Robinstown National School (c.570m north east of Tower 349).

It is evident that the proposed development has been generally routed to avoid community facilities, with only one, Oristown Church within 200m of the development. Whilst nearest to the line at c.150m from it, the Church is the type of facility which is used on occasion and not for extended periods. Furthermore, both the Drumhowan GAA Club and Laragh National School and Church are physically quite removed from the proposed development and separated visually by topography and/or vegetation. The remaining facilities listed lie >500m from the proposed development and I do not consider that impacts arising would be significant.

In addition to the above facilities, I note that the proposed development is routed in proximity to the graveyard at Dunderry (c.300m to the south west of Tower 341), through the site of the Dunderry Fair (see Section 4.4.2.7, Vol. 3D), which is held in the field adjacent to the graveyard, and to Dunderry House (which hosts workshops). I would consider that the proposed development would therefore detract from the amenity and setting of the graveyard (see Photomontage 61) and Dunderry Fair.

With regard to the GAA Centre of Excellence at Dunganny, the lands associated with this facility lies c. 250m to the south west of the alignment (and Tower 354). Pitches lie c.500m to the south west of the alignment (both separated from it by

the R161). Whilst the development will impact on the setting of the Centre, again it is removed from it and will not directly affected by it.

Finally, I do not consider that community facilities in Ballybay or Kingscourt (or other towns and villages in the vicinity of the route) would be adversely impacted by the development, primarily due to distance from these centres. As stated, I do not consider that the proposed development would adversely impact on population levels within the CMSA or the MSA and would not therefore impact on community facilities as a consequence of changes in population (e.g. decline in membership/demand for facilities etc.).

5.7.5.10. Impact on Gaeltacht

The proposed development passes through one of two small Gaeltacht areas in Co. Meath, centred on the townland of Gibstown, Baile Ghib. Observers argue that the area will become less attractive to visitors to the area (including those who come to learn Irish) and to young people buying houses in the area, with consequentially a detrimental impact on the Gaeltacht area, its history and language.

The Meath Gaeltacht is the smallest Gaeltacht area (44km^2) in the country and comprises two villages, Ráth Chairn and Baile Ghib. The proposed development is routed almost centrally through the Gaeltacht area of Baile Ghib I would estimate that this covers an area of c.30km^2. As the Gaeltacht area is quite small and as the principal visual effects of this are likely to extend to 600-800m of the alignment, I would accept that the development, with its central alignment, will detract from the visual amenity of this area. However, having regard to the routing of the proposed development generally away from residential property and community facilities, I would not anticipate the impact to be of such significance to cause secondary effects on land use or, therefore, the history or language of the area.

5.7.5.11. Impact of Temporary Access Routes

Having regard to the short duration of construction works, and the proposed means to mitigate impacts (as discussed in the Construction and Traffic sections of this report), it is considered that the use of temporary access tracks to construction sites, guarding locations or stringing areas will not give rise to significant environmental effects on population and economic receptors.

5.7.6. Summary and Conclusion

Key issues for this environmental topic include the impact of the proposed development on:

- Land and property values,
- The development potential of land and property,
- The local economy and community facilities, and
- The Gaeltacht.

In addition, concerns have been expressed regarding the proposals for community gain.

Having regard to the likely visual impact of the proposed development, and concerns in respect of health, it is considered that the proposed development may impact on residential property values/ability to sell, particularly, for those properties in close proximity to the route. Impacts on agricultural land are considered to be less significant. Due to the arrangements in place (including for compensation) set out in the ESB/IFA Code of Practice, it is considered that significant adverse impacts on the development potential of lands/property are unlikely to arise.

Having regard to the narrow corridor affected by the proposed development and its routing, away from population centres and community facilities, it is considered that the development will not significantly impact on the local economy, rural activities, community events or facilities. Impacts on the Gaeltacht will be limited to visual effects in proximity to the alignment.

The applicant's proposals for community gain are considered to be a reasonable attempt by the applicant to address some of the adverse effects of the development which may occur in the community through which the line passes. Notwithstanding this, it is acknowledged that there is substantial public opposition to the project and little local community acceptance of it in its current form.

5.8. Human Beings – Land Use

5.8.1. Environmental Impact Statement

Impacts on land use are dealt with in Chapter 3 of Volumes 3C and 3D of the EIS. Land uses along the route are identified as predominantly agriculture, forestry and horticulture. Sensitivities are assigned to these land uses (Table 3.1, Vol. 3C and 3D) and impacts are predicted on the basis of the anticipated magnitude of impact (Table 3.2, Vol. 3C and 3D).

The report states that the main difficulty encountered was that the majority of landowners along the route chose not to engage with the applicant's agronomist. Despite these difficulties the applicant considers that a detailed evaluation was carried out of land use along the route using roadside surveying and examination of aerial photography.

The EIS concludes that, for the CMSA:

- The development will have an imperceptible impact on land use in the CMSA arising from the construction of 134 towers on 2.7ha of land and 40ha of soil damage caused by construction activity.
- Residual impacts are either imperceptible or slight adverse on 93.5% of land parcels along the alignment. Thirteen moderate adverse impacts are predicted (6% of land parcels) due to potential restriction of farm yard development and one moderate adverse impact is predicted (0.5% of land parcels) at the construction materials storage yard due to soil damage.

For the MSA, the EIS concludes that:

- The proposed development will have an imperceptible impact on land use arising from the construction of 165 towers on 4.2ha of land, 57ha of soil damage caused by construction activity and the clearance of c.14.6ha of forestry.
- The residual impacts are either imperceptible or slight adverse on 95% of the land parcels along the route. Three moderate adverse impacts and one major adverse impact is predicted to arise due to potential restrictions on farm yard development (2% of land parcels). Four moderate adverse impacts and two major adverse impacts are predicted (3% of land parcels)

on forestry land parcels where the trees will have to be cleared within a 74m corridor, centred on the proposed development.

Chapter 3 is supported by the following:

- Location and size of land parcels along the length of the route, Figure 3.2 to 3.9 and Figure 3.2 to 3.12, Vol. 3C and 3D respectively.
- Predicted impacts on individual land parcels, Appendix 3.1, Vol. 3C and 3D.
- Location of temporary access routes, working areas, stringing areas and guarding locations, Figures 1 to 34, Vol. 3B.

5.8.2. Policy Context

5.8.2.1. Monaghan County Development Plan 2013 to 2015

The Monaghan DCP recognises the economic dependence of the county on a narrow base of manufacturing, agriculture and food sectors. Policies and objectives of the plan seek to:

- Protect high quality agricultural land within the county (Policy AG03),
- Encourage the continued use of agricultural farm holdings (Policy AG02), and
- Support the development of value added agricultural based activities and agri-food enterprises (Policy AGO7).

The plan acknowledges the importance of forestry development within the county, in line with government policy. Relevant policies and objectives seek to realise the potential of forestry through the promotion of appropriate related industries and rural tourism (Policy FYO2).

5.8.2.2. Cavan County Development Plan 2014 to 2020

The Cavan CDP supports the further development of agriculture with the county, farm diversification and forestry, for example through policy and objectives EDP1 to EDP3, EDO1 and EDO2 and EDP11 and EDP12).

5.8.2.3. Meath County Development Plan 2013 to 2019

The Meath CDP recognises the important contribution that agriculture has made and continues to make to the rural economy of the County. Policies and objectives of the plan seek to:

- Maintain a vibrant and healthy agricultural sector (Policy RD POL 10),
- Protect agriculture and agri-business from incompatible urban development (Policy RD POL 12), and
- Encourage agricultural diversification (Policy RD POL 13).

The Plan also recognises the important role of forestry supporting rural employment, rural diversity, climate change management and providing a recreational and amenity resource. Policies of the plan seek to encourage the sustainable development of forestry in the county (RD POL 15).

5.8.3. Issues raised by observers during the course of the application and during the oral hearing

The main issues raised by observers in submissions to the Board during the course of the application and oral hearing may be summarised as follows:

- Adequacy of EIS.
- Impact on farming and the rural economy.
- Impact on image of the agricultural industry/agri-food industry.
- Impact on the operation of the farm during construction.
- Impact on the operation of the farm during operation of the OHL.
- Impact on equine industry.
- Impact on forestry.
- Cumulative impacts.
- Conflict with policy.
- Site specific issues

In addition, third parties raised concerns regarding the impact of the development on health (family, employees, animals and crops) and on wildlife. These matters are dealt in the Health and Flora and Fauna sections of this report respectively.

The applicant's response to the issues raised is contained in Chapter 10 of EirGrid's submission to the Board dated 19th October 2016.

5.8.4. The Oral Hearing

Impacts on Human Beings – Land Use were principally addressed in Module 1.11 on the 29th April 2016 (Day 11) of the oral hearing. Issues were also raised extensively, in Part 2 of the hearing, by landowners, public representatives and interest groups.

Substantial submissions were made by the following observers:

- Diarmuid Lally, Meath IFA – Chairman (and speaking on behalf of the Chairman of Monaghan IFA, Chairman of Cavan IFA and the Regional Chairman IFA).
- John Comer, ICMSA.
- Lorcan McCabe, ICMSA (Cavan, Monaghan and Meath).
- Eugene Lamb, ICMSA and Kingscourt IFA.
- Cyril Darcy, landowner and agricultural consultant.
- Pat Farrelly, property consultant (on behalf of Joseph Clarke).

In attendance for EirGrid were:

- Jarlath Fitzsimons, Senior Counsel.
- Con Curtin, Agricultural Consultant, EirGrid.
- Robert Arthur, Senior Consultant (Construction), ESBI.
- Michael Sadlier, Veterinarian Surgeon Specialising in Equine matters.
- Aiden Geoghegan, Project Manager, EirGrid.
- Daireann McDonnell, Senior Ecologist, TOBIN.

5.8.5. Assessment

5.8.5.1. Adequacy of EIS

The observers, including representative of farming organisations, argue that the EIS is inadequate by virtue of the limited access granted to lands and, therefore, its assessment of impact on land uses. They argue that:

- The EIS underestimates the impact of the development on agricultural landholdings and the equine sector, and
- A greater number of landholdings will be adversely affected by the development than predicted (by virtue of the clearance of trees, hedgerows and forestry and continued operational maintenance).

Access to Lands, Survey Methodology and Identification of Land Uses

During the oral hearing, Con Curtin on behalf of the applicant (Day 21) confirmed that limited access had been granted to lands. He stated that for his assessment of impacts on land uses access had been granted only to 20 or 21 of the 402 landholdings along the route.

I note that the limited access to lands is acknowledged in the EIS and that it is addressed by reference to desk studies (including use of the CORINE data set, land registry data, CSO data and aerial photograph) and field studies i.e. observation of the landholding from the public road or adjoining lands where permission had been granted.

During the oral hearing, attention was drawn to instances where the applicant's assessment of land use differed from that of the landowner's[41] i.e.

- LMC132 and LMC134 – For these two land parcels, landowners stated that the applicant had identified the lands as beef enterprises (and other enterprises) and not 'bull beef' as identified by the landowner.

[41] See Appendix 3.1, Vol. 3C and 3D for applicant's assessment of land use of landholding.

- LMC059 – For this land parcel the landowner stated that the applicant had underestimated the size of the farm and had not identified the use of the landholding as a successful and longstanding stud farm. In Appendix 3.1, it is described in the EIS as an 'equine, beef and tillage enterprise'.
- LCT079 &079A – For these land parcels, the applicant had identified the landholding as a beef and sheep enterprise, whereas it was also a suckler cow and equine enterprise.
- LMC134 – For this land parcel, the applicant had omitted the breeding and training of horses (described as a beef enterprise in Appendix 3.1).

With regard the above, I comment as follows:

- LMC132 and LMC 134 – In the course of the oral hearing, the applicant's agronomist, Con Curtin, accepted that bulls, raised for bull beef, would be very sensitive to construction disturbance. However, he was of the view that the animals could be treated in a similar way to stock bulls kept on lands affected by construction i.e. confined to a separate part of the farm or housed during construction (with appropriate compensation if necessary to the farmer). Furthermore, he considered that this type of site specific issue could be identified in consultation with the landowner prior to construction (landowner liaison, mitigation measure 1.5, outline CEMP).

  Whilst I would accept the observers' argument that bull beef are animals which require little disturbance and movement, I consider that the applicants approach is reasonable for the short duration of the construction phase of the proposed development.

  Notwithstanding this, I would accept that the applicant has not identified land used for bull beef and has possibly underestimated the construction impact on the development on these farms, in that it may be more appropriate to identify the sensitivity of these land uses as 'high' rather than 'medium' (see Table 3.1, Chapter 3, Vol. 3C and 3D). Given the small number of landholdings affected, I do not consider that this raises a significant issue for the adequacy of the EIS.

- LMC059 - Impacts on the equine industry, and this land parcel in particular, are dealt with further below.
- LCT079 and 079A (and LMC133) - I note that suckler cows are not identified individually within Table 3.1 but, as clarified by Mr Curtin, they are included within the beef category. My understanding is that suckler cows are kept for the production of beef, rather than milk (with their calves staying with the herd and fed by the mother, until the calves are ready to be sold either for fattening or to a meat factory for beef). Given the similar sensitivities of these suckler cows to dairy cows, their inclusion in the 'beef' category by the applicant seems reasonable.
- LMC133 - I note that equine enterprises are generally identified as having a medium sensitivity, unless they comprise stud farms or race horse training enterprises (Table 3.1, Vol. 3C and 3D). The sensitivity of this land use, LMC133, therefore would not change from that identified in the EIS by the applicant.

In summary, having regard to the very few examples cited during the oral hearing (and in submissions to the Board) I would consider that overall the assessment of land use types carried out by the applicant's agronomist has accurately depicted the vast majority of land uses along the length of the route.

Impact Assessment

With regard to the assessment of impacts, the applicant uses a standard methodology for the prediction of impacts based on the sensitivity of the land use and the anticipated magnitude of impact (Tables 3.1 and 3.2, Vol. 3C and 3D). For example, with the development potentially having a greater impact on highly sensitive land uses, or on smaller landholdings, where the development would restrict the potential for farm yard development etc. The approach taken by the applicant seems reasonable and consistent with good practice.

Notwithstanding the above, it is evident from the submission made in respect of the proposed development that many third parties disagree with the significance of

the predicted impact on their landholding, notably the 'imperceptible' or 'slight adverse' impacts predicted for the majority of land parcels. However, much of the disagreement would appear to arise from the landowners' perceived effects of the development on their lands, which in addition to impacts on land use, includes for example, visual impacts, perceived health effects and the perceived impact on the value of land and property. However, in this environmental topic the applicant is seeking to address the impact of the development on the use of lands falling within the vicinity of the proposed development. And in this regard, I consider that the applicant's methodology for impact assessment is clear, consistent with standard practice and adequate for the purpose of EIA. Impacts on health, land and property values and the visual effects of the development are dealt with in other sections of this report.

Impact on Equine

The adequacy of the applicant's assessment of the impact of the proposed development on the equine sector is discussed below.

Number of Landholdings that will be Affected

The EIS sets out details on the temporary construction works and permanent features of the proposed development. It identifies the landholdings which will be affected and the types of impacts arising including clearance of trees, hedgerows and forestry and maintenance of the development over its lifetime. I consider therefore that the physical extent of the development and the number of landholdings that will be affected by the development, are adequately described.

5.8.5.2. Impact on Farming and the Rural Economy

Representatives of the farming community, public representatives and individual farm families draw the Board's attention to the important contribution that agriculture makes to the rural, regional and national economy. For example, Diarmuid Lally (representing the IFA), stated that in Meath the agricultural sector was responsible for 2,500 food processing jobs, extended to 4,500 farm families

and made a significant contribution to national agri-food exports. Observers argued that:

- The development would adversely impact on farming in the three counties through which it is routed.
- There was a lack of importance given to, and assessment of, the development on farming in the planning application documentation.
- The development was being imposed on many farmers against their will, with the consequences for the development for the rural economy.
- The development would result in the destruction of hedgerows, forestry and topsoil and result in '*sterile corridor of 74m in width on farms for a distance of 140km across the north east*'.

Chapter 3 of the EIS evaluates the potential impact of the proposed development on land uses. By virtue of its route, away from settlements and residential development, the land parcels falling under the route comprise almost wholly agricultural land, with a mix of:

- Dairy farms,
- Beef and/or sheep or grass cropping farms,
- Other farms e.g. pigs, poultry and equine,
- Forestry, and
- Horticulture.

The largest affected land use type is beef/sheep/grass cropping farms (Table 3.3, Vol. 3C and 3D of the EIS).

Chapter 3 (Vol. 3C and 3D) estimates that the area of agricultural land in Cavan, Monaghan and Meath is c.440,000ha (106,288 Co. Monaghan; 139,374 Co. Cavan and 191,846, Co. Meath[42]), with the development routed through 402 individual land parcels, with a total area of 7,000ha[43].

[42] 2010 Census data.
[43] 222 land parcels in the CMSA with an area of 2,390ha. 180 land parcels in the MSA with an area of 4,710ha.

As a consequence of the proposed development:

- In County Monaghan, tower sites will occupy 2.2ha. Short to medium term impacts will occur on 30.5ha due to damage to soil at construction sites, stringing areas, guarding locations and along temporary access routes. Impacts on the 2ha construction material storage yard will be more long term.
- In County Cavan, tower sites will occupy 0.52ha. Short to medium term impacts will occur on 8ha.
- In County Meath, tower sites will occupy 4.2ha and short to medium term impacts will occur on 57ha. In addition, 14.6ha of commercial forestry will be cleared.
- In total, the development will occupy 6.9ha and cause short to medium term damage to soils on 97ha and result in the clearance of 14.6ha of commercial forestry.

It is evident from the above that the area of land directly affected by the proposed development represents a small area of the land parcels affected by it and a very small area of the total area of agricultural land within the three counties.

This assessment of land take does not include the area of land falling under the OHLs or the 74m corridor alongside the route as referred to by the observers. However, from the information on file and as presented at the oral hearing, it is evident that the presence of the overhead lines is not considered to be an impediment to farming activities, with most activities capable of taking place safely within the vicinity of and under the electricity lines (see below). A 74m corridor is only required where the line is routed through forestry and a very small area of forestry land is affected by the development (14.6ha).

It is my view, therefore, that the applicant has acknowledged that the development will impact on agriculture within the three counties through which it passes. However, based on the small land take, this impact will not be significant at county level, or therefore at regional or national level.

5.8.5.3. Impact on Image of Agricultural Industry/Agri-food Industry.

Representatives of the farming industry refer to the significant volume of agri-food exports from County Monaghan and County Meath, the highly competitive nature of the international marketplace for exports and the important of the 'clean and green image' of Irish agriculture. Observers raise concerns that the proposed development:

- Will negatively impact on this 'clean and green' image with implications for competitiveness and product sales.
- May impact on the food chain, for example, with adverse effects on milk or beef produced by cattle grazed under the development.
- May impact on various farm assurance schemes with consequences for participating farmers.

As concluded above, the proposed development will impact directly on a very small proportion of agricultural land within counties Cavan, Monaghan and Meath. Further, as stated in the Landscape section of this report, significant residual visual impacts will be confined to the immediate environment of the proposed OHL. Any impact of the visual image of the agricultural industry, if perceived as a consequence of the proposed development, will therefore be confined to the narrow corridor of the route. I do not consider, therefore, that the proposed development would adversely impact on the image of the sector as a whole. In this regard, I would draw the Board's attention to the applicant's arguments that the farming industry, nationally, continues under the existing extensive network of high voltage overhead lines within the country (110kV, 220kV and 400kV).

As discussed in the Health section of this report, there is no evidence of any adverse effects of OHLs on milk or beef produced by cattle grazed under overhead lines or in vicinity of them.

With regard to Quality Assurance schemes, I note that none of the schemes currently in place for the industry, e.g. Bord Bia's Beef and Lamb Quality Assurance Scheme, Egg Quality Assurance scheme, Grain Quality Assurance

Scheme, the IOFGA Organic Food and Farming Standards in Ireland etc. make reference to overhead power lines in their requirements for assurance.

5.8.5.4. Impact on the Operation of the Farm during Construction

Numerous parties draw the Board's attention to the significant disruption to daily farming activities during construction[44]. Issues arising include:

- The temporary loss of land and, possibly restricted access to adjoining lands.
- Disruption arising from the temporary use of access routes.
- Adequacy of access routes and damage to lands.
- Security of, and disturbance to, livestock.
- Loss of hedgerows/stonewalls.
- Disturbance to field drainage.
- The risk of disease.
- Access to water and the risk of water pollution.
- Municipal sludge.
- Health and safety of family and workers.
- Impact on farm payments and quality assurance schemes.
- Relevance of compensation measures to tenants.
- Control of contractors.

Observers argued that mitigation measures proposed offered little assistance in the face of the impacts.

[44] For example, Maria Fitzpatrick (tower 104) where would her horses be kept during construction if could not access grazing land; Nigel Donaldson (tower 118), effective loss of a small field during construction (and operation); Noel and Martin McGarrigle (tower 118-122), loss of land and yard during construction works and impact on their daily use of farm lane; Damien Woods (tower 126), fencing off of access route would inhibit use of farm; Charlie Mulligan (tower 146), use of farm access to farmyard over recently tarred lane, on bog, not suitable for HGVs, impact on daily use of farm yard, damage to soils, wet lands, would destroy same forever; Cyril Darcy (tower 343) impact on farm payments, reduced are for nitrate discharge/stocking rates, construction noise/dust, compaction of soil, impact on drainage systems; risk of disease spread between farms (including soil borne disease) and risk of TB.

Temporary Loss of Lands/Access to Adjoining Lands

Land take for the construction phase of the development is relatively modest and comprises:

- 30m x 30m working area at tower sites,
- 3.5m wide access route (typically along existing farm tracks),
- 10m x 4m guarding locations, and
- 20mx20m stringing areas.

Construction works will be carried out over a short duration with Phase 1 over a 6 to 8 week period and Phase 2 over eight to twelve days, approximately 12 months after completion of Stage 1. Temporary fencing[45] would be in place around construction sites and along temporary access routes, if required, for the 6 to 8 week period associated with Phase 1.

Given the linear nature of the proposed development and its small footprint, land loss at any one location is relatively small and occurs for a relatively short period of time. Notwithstanding this, I would accept that the construction phase of the development, in particular Stages 1 to 3, will result in the temporary loss of lands to the farm and may make access to other parts of the farm more difficult. The applicant acknowledges these impacts and in the application for approval sets out a series of mitigation measures to address these impacts. Additional undertakings were given at the oral hearing. Mitigation measures include:

- Liaison between the landholder and contractor prior to works commencing to identify site specific issues and the management of these, including that landowners have reasonable access to all parts of their farm (Item 1.5, 2.2 and 2.4, Summary of Mitigation Measures, Chapter 11, Vol. 3B)

[45] Fencing would typically be Heras Fencing around construction sites (see applicant's submission to the oral hearing No. 26) or electric fencing (or smaller Heras Fencing) along access tracks.

- The movement of stock off lands, if it is considered to be necessary by the landowner (e.g. if stock is sensitive, such as equines, pedigree herds, stock undergoing embryo transfer, bull beef), with compensation payable for additional costs incurred (Con Curtin for EirGrid).
- Compensation for any loss of crops or damage to lands (which has occurred and is anticipated to occur for up to period of 7 years[46]). (ESB/IFA Code of Practice, and Con Curtin for EirGrid).

Whilst landowners will therefore experience temporary loss of lands and inconvenience as a consequence of construction, I consider that the applicant's proposed mitigation measures are adequate to enable essential farm practices to continue over the short duration of the construction programme and the welfare of livestock to be maintained (with compensation for any costs incurred by the farmer).

Disruption Arising from the Temporary Use of Access Routes

As stated in the Construction section of this report it is the applicant's intention to access construction sites, guarding locations and stringing areas via the public road network and the temporary use of existing private access lanes/roads which currently provide access to property and lands within the project area. For the farming community, this could mean the temporary use of existing agricultural access tracks within their landholding and the movement of construction traffic through their working farm yards and the movement of vehicles across agricultural land.

I would accept in many case that the use of such tracks, in particular if routed through a working farmyard, could impact on the day to day operation of the farm. However, whilst inconvenient, I am mindful of the applicant's mitigation measures (see outline CEMP) which include liaison with landowners prior to construction and, as stated in the course of the oral hearing, agreements regarding the use of access lanes to enable farming practices to continue and use of an observer for

[46] The applicant acknowledged that compacted land can take 2-7 years to recover, Con Curtin, EirGrid, day 21 of oral hearing.

HGV movements through sensitive sites (including farm yards). I would consider therefore that the shared use of access routes could be managed for the short duration of the construction phase by liaison between the parties to facilitate the on-going operation of the farm.

Adequacy of Access Routes and Damage to Lands

Many landowners draw the Board's attention to the inadequate nature of the some of the proposed temporary access routes which the applicant proposes to use, with heavy construction equipment damaging the lane or proposed route, for example surface condition, underlying drains, culverts etc. In addition, having regard to the nature of land within the study area, in particular, typically heavy soils, wet ground conditions and the steep topography of some of the tower sites (e.g. Tower 166, see Construction section of this report), the observers argue that construction equipment would also damage agricultural land over which it traverses with long term effects.

In the Construction section of this report, it is considered that, having regard to the proposed construction methodology, the applicant had demonstrated that the proposed temporary access routes would be adequate to accommodate the proposed development. Of note, construction methodology includes:

- Use of existing entrances from the public road.
- Use of agricultural scale equipment, or if required, the 'stepping down' vehicles to match the scale of the access route,
- Means to minimise damage to access lanes/land/vulnerable soils, for example, use of low pressure vehicles, matting, temporary bridges etc. over poor ground/drains etc.
- Proposals to engage with landowners prior to construction works to identify concerns e.g. drains underlying access routes, to carry out pre and post construction survey of lanes, if required, and to repair or compensate for damage caused.

In view of the above, I would accept that the proposed access routes, comprising in most instances existing access routes to agricultural land, are generally adequate[47] to provide access to the construction sites, stringing areas and guarding locations. However, I would also accept that in some instances where ground conditions are poor or where a large number of vehicle trips are proposed (e.g. with the stepping down of equipment, (see Traffic section of this report), it is possible that damage to access routes could occur. This is accepted by the applicant in the EIS and Item 1.8 of Table 11.1 (Summary of Mitigation Measures), specifically states that once all works are complete, the land used for temporary access routes and construction areas around the overhead structures will be reinstated as close as possible to their original condition. The ESB/IFA Code of Practice also provides for compensation for any temporary losses, for example, reduced crop yields.

Again whilst I acknowledge that the temporary use of access routes will cause inconvenience for farmers, having regard to the above, I do not consider that any significant residual impacts will arise for landowners as a consequence of this.

Security of, and Disturbance to, Livestock

Observers draw the Board's attention to:

- The risk to straying livestock as a consequence of construction works.
- The impact of noise and dust on farm animals.

It is my understanding from the application file and the oral hearing that all existing farm fencing would be maintained. Furthermore, as stated above, additional stock proof fencing would be used as necessary to prevent livestock access to construction sites and the straying of stock e.g. Heras fencing or electric fencing. I note the applicant's undertaking that where temporary Heras/electric fencing was inadequate for stock, or stock was particularly sensitive, animals could be moved to another field or off site (e.g. for horses to a livery yard), with compensation to the farmer for same, if necessary.

[47] I note that many of the landowner's photographs of the proposed access routes also demonstrate the viability of the proposed routes See oral hearing presentations by Anne Murray, CMAPC, Dermot Daly, Des Marron etc.

I consider that these arrangements, whilst possibly inconvenient to farmers, are acceptable for the short duration of the construction works and would ensure the security of farm livestock and no financial loss to the farmer.

With regard to noise, I draw the Board's attention to the following:

- The applicant's intention to use of agricultural scale equipment.
- The limited duration of construction works.
- The proposed means to construction noise at construction sites (see the section on Noise in this report).
- The applicant's proposals for mitigation which include liaison with landowners in advance of works, warning of landowners on adjoining lands and the control of noise (Items 2.2, 2.7, 7.1, 7.3 and 7.4, Table 11.1, Summary of Mitigation Measures, Vol. 3B).

In addition, during the oral hearing the applicant gave commitments to ensure that works would be carried out at a time to minimise impacts (e.g. milking) and that stock would be removed from affected lands, if required.

In view of the above, I do not accept that noise from construction activities or from construction traffic would significantly impact on livestock.

With regard to dust, this could be an issue at some construction sites in extended periods of dry weather and the Board may wish to include a condition to limit dust emissions in the event of such weather conditions arising.

Loss of Hedgerows/Impacts on Stonewalls

The impact of the proposed development on hedgerows and treelines is considered in the Flora and Fauna section of this report. It is accepted that the proposed development will directly impact on mature treelines and hedgerows in the proximity of tower sites (150m of hedgerows, 30m of treelines) and of hedgerows and treelines under the OHL where trimming may be required (92

hedgerows and 56 treelines). Impacts are considered to be minor to moderate impacts (worst case scenario). I would accept therefore that in the vicinity of the proposed development, there would be some loss of hedgerows and mature tree lines, dependent on the clearance of the overhead line.

With regard to wider impacts, (outside the route corridor), having regard to the proposed principles of construction whereby the applicant will utilise existing access points and gaps in hedgerows to access construction sites, scale down construction equipment to suit the access route, impacts on hedgerows will be generally limited. Where it is necessary to cut a hedgerow to ground to facilitate access, I note that this will be reinstated. Any impact will therefore be minor and short term.

I note that where small number of low stone walls are encountered (e.g. in alternative access route to Tower 109), the applicant proposes using a temporary bridge structure (over the stonewall) to provide access to lands whilst protecting the stonewall.

Disturbance to Field Drainage

I note the applicant's intention to divert any field drains occurring within the construction area of a tower in a manner to maintain existing land drainage arrangements. In view of this I would accept that significant impacts as a consequence of disturbance to field drainage are unlikely to arise.

Risk of Disease

A number of observers draw the Board's attention to:

- The risk of animal and crop disease on farms arising from construction, as vehicles and personnel travel from farm to farm,
- The risk of TB with the migration of disturbed badgers,
- The issue of compensation in the event of losses arising from any introduced animal or crop diseases.

Chapter 3 of Volumes 3C and 3D acknowledges the risk of disease spread with movement from farm to farm. Mitigation measures require the contractor to provide adequate training in relation to biosecurity on farms, adhere to disease protocols and comply with any Department of Agriculture, Food and Marine regulation pertaining to crops and livestock disease (Items 2.3 and 2.5, Table 11.1, Vol. 3B). In addition, during the oral hearing, Con Curtin, for the applicant stated, that as set out in the ESB/IFA Code of Practice, the contractor would be required to liaise with the local District Veterinary Officer and the Epidemiology Unit of the Department of Agriculture with regard to TB.

I note that the ESB/IFA Code of Practice also states:

> *'Where possible the Board shall not drive machinery through farm yards or other places where there is an accumulation of animal manure. If this is necessary, the Board shall take adequate precautions to disinfect vehicles before and after entering the land, especially on farms with a disease problem (or with neighbouring farms having a disease problem), or where the ESB vehicles have recently been in a farm with a disease problem'.*

One of the observers, Mr Cyril Darcy an agricultural consultant and owner of lands in respect of Tower 343, made three key points in respect of the proposed measures:

- Firstly, that the Code of Practice does not refer to soil borne disease,
- Secondly that the Department and District Veterinary's Office may not be aware of all diseases occurring on the farm (e.g. potato eelworm) and
- Finally, that the applicant's approach to accessing tower sites (movement of machinery through farm yards), is inconsistent with the Code of Practice.

I note that the Code of Practice does not specifically refer to soil borne disease, but it does refer to the disinfection of vehicles between farms, which I would infer to include the removal of soil/accumulations of animal manure from vehicles. Furthermore, during debate on the topic the applicant's agronomist, Con Curtin, stated that the contractor would be required to liaise with the landowner to ensure that any farm specific disease protocols would be adhered to and I consider that

this would be appropriate for those farmers concerned regarding the import of disease (crop and soil borne) to the farm. This would ensure that any additional disease control measures associated with the range of Quality Assurance Schemes in place on farms would be adhered to. I note that the current schedule of mitigation measures does not specifically refer to liaison with landowners in respect of disease control measures. However, this matter could be addressed by way of condition.

Whilst I acknowledge third parties concerns regarding the spread of disease, I consider that the applicant's approach to mitigation of this risk is integrated with the formal disease control system in the State and local farm specific requirements and would minimise the risk of animal or crop diseases being spread from farm to farm.

With regard to the spread of TB, impacts on badgers and badger setts are set out in the Flora and Fauna section of this report. It is considered that with the relatively small construction sites, based primarily in improved agricultural land, significant impacts on the badger population (known and unknown) are unlikely. For the same reasons, and having regard to the above protocols which will be in place, I do not consider that there is a serious risk of the spread of TB arising from the proposed development.

With regard to compensation, the IFA/ESB Code of Practice, which the applicant has stated will be adhered to for the project, states that a landowner would be paid compensation in respect of any losses to material property arising from the proposed development. I would conclude therefore that a landowner would be compensated by the applicant in the event of an outbreak of disease on the farm, resulting from the importation of soils etc. to the landholding as a consequence of the development.

Access to Water/Impacts on Water

During the oral hearing the applicant demonstrated how access to water could be maintained for livestock, across the fenced access route, using a system of electric fencing 'gates'. In the event of this not being possible, the applicant undertook to maintain water supplies e.g. by direct provision of drinking troughs and water tanker. This approach seems reasonable and consistent with requirements in respect of animal welfare.

The impact of the development on water quality is dealt with the Water section of this report. It is concluded that no significant impacts on farm water pollution will arise as a consequence of the development.

Municipal Sludge

On Day 20 of the oral hearing, Brendan Bagnol (landowner in respect of proposed Towers 358 and 359) raised the issue of municipal sludge i.e. how the applicant would deal with lands if municipal sludge had been spread on them.

As stated above, the applicant proposes to liaise with individual landowners to identify site specific conditions which need to be addressed during construction. Any lands where municipal sludge has been spread (i.e. as part of a nutrient management plan) construction works could be scheduled to take place after the sludge has been assimilated into the soil. If necessary, this matter could be addressed by condition.

Health and Safety

During the oral hearing, a small number of landowners draw the Board's attention to the additional health and safety risks posed to landowners and farms with the construction of the proposed development on their lands.

Under separate legislation, the contractor employed to construct the proposed development would be required to put in place appropriate health and safety measures and these do not fall within the scope of this application for approval.

Of relevance here, I note the applicant's intention to put an 'observer' along the proposed temporary access routes in the vicinity of residential farm properties and within farmyards to manage the safe movement of HGVs.

Impacts on Basic Farm Payment, Infringement of Stocking Rates under Nitrates Directive/Impacts on Other Subsidies/Quality Assurance Schemes

Farming groups and many individual landowners draw the Board's attention to the impact of the proposed development on the farm payments, with the loss of lands to construction works, implications for stocking rates under the Nitrates Directive and to the impact of the development on quality assurance schemes.

As stated in the application documentation and as re-iterated by the applicant in the course of the oral hearing (Jarlath Fitzsimons SC and Con Curtin, Agronomist), any impact arising as a consequence of the proposed development that is attributable to it, including financial losses arising from lands not being eligible to be included within the Utilisable Agricultural Area of any farm payment scheme or impacting on inclusion in any Quality Assurance scheme, would be compensatable. I am satisfied that there would be no significant impacts on landowners in this regard as a consequence of the development.

Implications for Insurance/Treatment of Tenants

During the oral hearing, Jarlath Fitzsimons for the applicant referred the Board to the ESB/IFA Code of Practice which states that indemnification and compensation apply to both landowners and tenants.

Control of Contractors

I note the observer's concerns regarding the contractor's adherence to the construction methodology and mitigation measures proposed by the applicant. I consider that these are important aspects of the management of the environmental effects of the project.

The outline CEMP states that:

- The ESB, as employer, shall require the contract to implement the mitigation measures set out in the EIS, NIS and any conditions of planning approval.
- The contractor will liaise with landowners prior to construction (by appointed landowner agent, Items 1.5 and, wayleave agent, 2.2 of Table 6.1).
- The contractor will appointment of an Environmental Officer to monitor the construction phase of the project.

In addition, during the oral hearing the applicant referred to the appointment of Agricultural Liaison Officers who would work closely with landowners during (and after) construction [48].

The above arrangements are acceptable and consistent with good practice, and should ensure the adherence to mitigation measures. However, I note that the outline CEMP does not refer to the appointment of agricultural liaison officers. I consider that due to the potential for impacts on the farming industry and the importance, therefore, of mitigation measures, I consider that this specific aspect of the development should be further controlled by condition (if the Board are minded to grant approval for the development) i.e. that prior to the commencement of construction the applicant shall appoint an Agricultural Liaison Officer who shall be responsible for liaison with landowners during the construction phase of the project, and thereafter, to identify issues of concern to individual landowners and to agree a detailed methodology for construction, in accordance with the measures set out in the application for approval.

[48] Jarlath Fitzsimons, day 32, oral hearing.

5.8.5.5. Impact on the Operation of the Farm during Operation of the OHL

Farming organisations and numerous individual landowners draw the Board's attention to the permanent effects of the development on farms. Issues raised include:

- Loss of lands and farm payments.
- Impact on investment made and the future development potential of holdings.
- Impact on the development potential of lands.
- Practical implications for farm operations.
- Implications for change of farming practices.
- Limitations on the use of electrical equipment.
- Noise.
- Health and safety.
- Impacts of future maintenance.

Loss of Lands and Farm Payments

On completion of construction works the proposed development will result in a small permanent land take at the base of each tower. From the information on file and from that discussed during the course of the oral hearing it would appear that, depending on the nature of the land use, this small area of land can continue to be used for farming activities e.g. grassland. For other land uses e.g. cereal crops, this would not be possible.

Where it is not possible to utilise land under the tower bases, the eligible area included for any farm support payments, in respect of the Nitrates Regulations etc. would have to be reduced. However, as indicated in the ESB/IFA Code of Practice, landowners will be paid compensation if such losses are incurred as a consequence of the development[49]. I do not consider therefore that significant impacts would arise for any landowner, in respect of farm payments, as a consequence of the development.

[49] Con Curtin, EirGrid, day 11, oral hearing.

Impact on Investments Made and the Future Development Potential of Holdings

The observers' draw the Board's attention to their concerns regarding the impact of the development on:

- The investments made in improving/reclaiming/draining land, improving and preserving buildings and the impact therefore on the value of farm land, property and agricultural buildings, with holdings often having been built up over generations.
- The future development of the farm, including development by young farmers who may be deterred by perceived health risks.

The impact of the proposed development on land and property values is discussed in the section of this report on Human Beings – Population and Economic. It is considered that whilst the proposed development may have some impact on agricultural land values, due to the multiplicity of factors which impact on the sale of agricultural land and the relatively small are coming onto the market, impacts may be quiet modest.

With regard to the future development of farms, it is considered (below) that the proposed development will not significantly impede farming activities under, or in the vicinity, of the proposed development.

With regard to farm buildings, as accepted the section on Population and Economic, there is no restriction on building in close proximity to the line but a requirement to inform ESB of development falling with 23m of it[50]. However, the applicant does acknowledge that due to the proximity of the proposed development to existing farm yards, for some land parcels the development will impact on the expansion potential of the farm yard (thirteen land parcels in the CMSA and three land parcels in the MSA – Appendix 3.1 and Section 3.7.3, Vol.

[50] This issue was raised by a number of agricultural landholders, including by way of example, lands owned by Jimmy Marron in the vicinity of tower 184 who wished to build a farm building c.20 m from the outer line and c.30m from the inner line. It was accepted by EirGrid (day 28 of hearing) that this would be acceptable in principle as it fell outside of the 23m advisory distance, but in practice would depend on the height of the building (see also photographs submitted to the Board during the oral hearing by Mr Marron).

3C and 3D). For example, this could result in a degree of separation between the existing farm yard and a future yard. I would accept therefore that the proposed development would have a moderate to severe impact on the future development of a relatively small number of farm holdings along the route.

Practical Implications for Farming Operations

Observers draw the Board's attention to the practical implications of the proposed development on agricultural fields in which the pylons are situated, for example:

- With towers creating an obstacle which is difficult to work around (e.g. harvesting crops/spraying).
- Rendering small fields very difficult to use or large parts of fields unusable (e.g. with machinery unable to pass between it and natural obstacles).
- With tower sites harbouring weeds.
- With vegetation trimming reducing shelter for animals.

These impacts are acknowledged by the applicant, are referred to, and taken account of, in the impact assessment on individual land parcels set out in Appendix 3.1 of the EIS (Vol. 3C and 3C) i.e. towers being an obstacle to farm machinery, potential reduction in hedge/shelter, land take relative to size of holding.

Furthermore, the impact is addressed by the applicant in part by way of an annual 'mast interference payment', to enable weeds to be cleared or as compensation for loss of farm payments.

However, it was also indicated by the applicant in the course of the hearing that all losses directly attributable to the proposed development would be compensated[51]. I would infer from this that if areas of a field were indeed rendered difficult or impossible to use, that this would be addressed by the applicant by way of compensation.

[51] Con Curtin, EirGrid, day 11, oral hearing.

I would accept, therefore, the concerns raised by third parties, acknowledged by the applicant, that in many cases the proposed development will impact on the farming practices in agricultural fields in which the proposed pylons are based, particularly on small fields. Whilst no financial losses should occur, because of the arrangements for compensation, I would nonetheless accept that the towers would in many cases cause an inconvenience to farmers.

Change of Farming Practices

Some of the farming groups draw the Board's attention to the absence of assessment of the potential impact of the development on farms should the enterprise type change, e.g. from tillage to dairy.

I note that the applicant's assessment does not include the impact of the proposed development on the land parcel in the event that the farm enterprise changed. Furthermore, I would accept that such changes could alter the significance of impact predicted. However, I consider that this level of analysis is not warranted as there was little information presented to suggest that a significant number of farmers are actively considering making such a change.

Limitations on the use of Electronic Equipment

A number of observers draw the Board's attention to their concerns regarding impact of the development on modern farm machinery, notably GPS equipment, with the risk of this failing in the vicinity of the proposed development. Of note, parties raised concerns regarding the applicant's advice, as a consequence of interference, to switch off the equipment in the vicinity of the development.

Global positioning systems and other computerised systems are used increasingly on farms, for example, with technology to record exact location and application of fertiliser etc. During the course of the oral hearing the applicant's agronomist accepted the potential impact of the steel lattice towers on GPS equipment i.e. that it could fail in the vicinity of the proposed development (it was EirGrid's view

that the conductors were unlikely to interfere with GPS as they would be too small to physically interfere with a signal and the frequency at which the OHL operated differed significantly from that of GPS). However, it was also noted that other features of the rural environment can similarly impact on the performance of the equipment (e.g. trees/treelines) and that some systems are capable of extrapolating data if there is a break in the signal.

Based on submission from both applicant and third parties, I would acknowledge therefore that it is likely that the proposed development may cause some interference with GPS systems and that this would cause inconvenience to both farmers and contractors alike.

However, I am mindful that the proposed development is a linear project, with most landholdings hosting one or a small number of pylons. I would consider therefore that for an individual landowner, the impact of OHL on GPS equipment will be relatively modest.

Noise

The observers draw the Board's attention to noise emanating from OHLs and the impact of this on themselves and farm animals. This matter is addressed in the Noise and Vibration section of this report.

Health and Safety

Numerous parties draw the Board's attention to the impact of the proposed development on their own health, their family and employees and on animals and crops on the farm. This matter is dealt with in the Health section of this report.

Representatives of the farming industry and numerous landowners also argue that the proposed development will introduce a safety hazard to farms, arising from:

- The use of farm equipment under the overhead line (in particular within the drumlin landscape).

- The potential for arcing of electricity and for stray electricity.
- Potential accidents especially on steep topography.

It is argued that the development therefore has implications for their responsibilities and liabilities in respect of their employees and may impact on the willingness of agricultural contractors to carry out work on their land.

The proposed development has been designed in accordance with the required European Standard (EN50341-1) and will have a resultant minimum sag of 9m i.e. it will not extend beyond 9m above ground level, along the length of the route. I note the applicant's confirmation, in the course of the oral hearing, that the design standard takes account of the prevailing weather conditions in the country (including extreme weather events) and that the development will be maintained in the longer term to ensure compliance with this standard (Robert Arthur, EirGrid).

The HSA's *Guidelines for Safe Working Near Overhead Electricity Lines in Agriculture* (HSA, 2010) acknowledges that overhead power lines can pose a serious risk to farmers, contractors or anyone in the vicinity of high machinery passing close to these lines. The guidance document states that as general guidance, the ground clearance of overhead lines crossing farmland and areas accessible to vehicles and agricultural machinery will accommodate safe passage of machinery and equipment up to a maximum height of 4 metres. It also states that when planning to carry out work in the vicinity of OHLs where machinery will exceed 4 metres it may be necessary to contact ESB Networks for advice on the site specific safe clearance available.

Within this context, and as argued by the applicant, it would appear that typical agricultural machinery, for example, a tractor with a typical height of 2.8m to 3.0m can operate safely under the proposed development, including low trajectory slurry spreaders. It was also argued, and I would accept, that some of the more substantial farm machinery with a working height of >4m could also be managed at less than 4m and work safely under the proposed development, for example, hedge cutters, telescopic loaders, loaders on the front of tractors.

For other machinery with a fixed working height of >4m, e.g. silage harvesters, it was acknowledged (and again I accept this argument) that larger combine harvesters may be restricted depending on their actual height or require site specific advice from ESB (see submission No. 34 to OH), but some of these are likely to operate quite safely under the proposed development (e.g. silage self-propelled machine with a fixed height of 5.5m). Similarly, some systems for the disposal of soiled water on dairy farms would be restricted under and in the vicinity of the proposed development e.g. rain guns, pressurised sprinkler systems[52].

The proposed development therefore inevitably poses a risk to farmers or their contractors, when working in close proximity to it, when using equipment which is more than 4m in height. This risk is acknowledged by the applicant.

Notwithstanding this, I would note that overhead power lines cross almost every farm in Ireland and are a risk that is already managed by the farming community. I would consider that the proposed lines are no more of a risk than the lower voltage lines (which have a much lower ground clearance) and I consider that this risk is also one which can be managed.

With regard to 'arcing' or electricity jumping over a gap, this phenomenon was acknowledged by the applicant who stated that the 'flashover distance' was dependent on many factors, for example, use of equipment with rubber tyres on a dry day in proximity to an OHL or an aluminium ladder on a wet day. The applicant also stated that the OHL had been designed with its minimum clearance above ground of 9m to take this phenomenon into account and I assume therefore that the HSAs guidance on the safe operation of farm equipment also takes into account the risk of arcing. Within this context I consider that the risk of electrocution from arcing has been provided for within the guidelines which exist for the agricultural sector as discussed above.

[52] I also note that applicant's clarification in the oral hearing that if the proposed development required the alteration of systems for the disposal of soiled water, this was a matter which could be compensated.

With regard to stray electricity, Aidan Geoghegan, for the applicant, argued that this arises primarily due to problems with local wiring (e.g. in the milking parlour) and does not occur as a consequence of stray electricity from a high voltage OHL. No information was tabled by any third party to contradict this source and I am minded, therefore, to accept the position of the applicant.

With respect to potential accidents arising from the use of farm equipment in the vicinity of the proposed development (e.g. if a silage bale rolled down a drumlin and struck a tower), again I would draw the Board's attention to the IFA/ESB Code of Practice, which states that all loss or damage, claims, demands, costs and expenses which the landowner (or tenant) becomes legally liable to pay as a consequence of the development are indemnified by the Transmission Asset Owner (unless malicious).

Impact of Future Maintenance

The observers argue that the proposed development will impact on the farm with the maintenance of the OHL, including biosecurity and the costs associated with the maintenance of wayleaves.

Maintenance requirements in respect of the proposed development are set out in Section 7.3.11.1 of Volume 3B. These comprise helicopter patrols (annually) and a climbing patrol once every 5 years, tree and hedge cutting where vegetation has grown within the electrical clearance envelopes, conditions survey (every 35 years and which includes painting) and infrequent replacement of earth wire and insulators.

I do not consider these requirements to be onerous and are regularly undertaken in respect of the existing OHL infrastructure in the country. Further, any issues regarding bio-security for the infrequent vegetation trimming and conditions survey could be dealt with by conditions.

Summary of Residual Operational Impacts

Appendix 3.1 (Vol. 3C and 3D) identifies for each landholding the long term effects of the development on farming activities, for example, typically referring to the matters discussed above. As stated, I consider the impact assessment to be generally robust and in the vast majority of cases impacts are predicted to be imperceptible to slight (93.2%, CMSA; 94.5%MSA).

As stated I understand the farming community's concerns regarding these conclusions. However, in so far as impacts on land use are concerned, I would accept that in the majority of cases existing land uses can continue under the proposed development and within its vicinity.

Of note, however, a small number of moderate impacts are predicted for land parcels where the proposed development will limit the future development of the farm yard, and one major adverse impact where the development passes through land parcel LMC-029.

This land parcel comprises an established and substantial horticultural enterprise (McCormack Farms), growing herbs and baby leaf salads for supply to national retailers and employing over 120 staff[53]. The residual major adverse impact is predicted on the basis of the central alignment of the proposed development over the company's polytunnels and the potential restrictions on land use for additional buildings. If the Board refer to recent aerial photography in respect of the alignment, more recent polytunnels' will be evident in close proximity to the proposed development. In view of this proximity, and issues arising for the future development of lands (and the significant number of employees), I would concur with this conclusion and consider that it may constrain the future development of the site.

5.8.5.6. Impact on Equine Industry

[53] Stephen McCormack, day 32, oral hearing.

The observers draw the Board's attention to the impact of the proposed development on the equine industry, in particular thoroughbred horses and race horses. They argue that:

- Research indicates that overhead lines have detrimental effects on bloodstock[54] (from exposure to EMFs).
- When working in areas with high voltage lines (even at distance) horses can become hard to handle and spooked by noise/shadows caused by them which would put handlers and riders at risk and increase health and safety premiums.
- Low flying helicopters and unrestricted access for repair and maintenance would pose disease control issues for stud owners.
- The proposed development will be unsightly and reduce appeal of country to foreign investors in horses and consequently jobs in stud farm.
- The development could harm the Irish racehorse industry and Irish racehorse breeding industry, which has an international reputation.

Impact of EMFs on equine health is considered in the Health section of this report.

In response to issues raised the applicant refers to their report *Responding to Equine Concerns* (EirGrid, 2015, Appendix 10.1, Response document). Appendix 3 of the document contains a report on *Equine Psychology and Behaviour*. Essentially it concludes that horses habituate to stimuli:

> *'Horse Management....horses will adapt themselves to repeated aural and visual stimuli. Thus horses that graze in paddocks adjacent to any physical infrastructure, such as roads, airports, airfields, helicopter pads, telephone poles, electricity pylons, cell phone masts etc. become rapidly acclimatised to their presence and the noise and visual effects of these physical infrastructures rarely if ever result in injury to these acclimatised horses'.*

In the course of the oral hearing, Michael Sadlier, an equine veterinary surgeon for the applicant, referred the Board to Castlemartin Stud Farm in Kilcullen, Co. Kildare, which has a 400kV OHL line running through the north of the estate with a

[54] Thoroughbred horses, especially when bred and sold for racing.

steel lattice pylon in the yearling yard (of the Greenhill's Stud Yard on the 750 acre the estate).

There are clearly different views between the applicant and third parties regarding the impact of OHLs on the behaviour of horses. Having observed horses graze alongside motorways and other busy roads and, for example, in the vicinity of Dublin airport, I would accept the argument that equines, like other animals, will habituate to their surroundings and I did observe in aerial photography the existing 400kV steel lattice tower in close proximity to Greenhills Stud Farm on the Castlemartin Estate.

However, by the same measure I would accept that equines, in particular, thoroughbred animals, may react adversely to exposure to high voltage overhead lines, in particular with initial exposure or unexpected exposure and that it the short term, at least, this could increase the risk of accidents. I can understand therefore why the equine industry may choose to avoid high voltage overhead lines if possible.

I would also accept that for a successful home industry seeking to attract international investment that the visual impact of the lines on any equine business is a very sensitive matter.

Within this context I also note the applicant's own categorisation of stud farms (large scale equine, breeding regionally and national important horses) and race horse training enterprises as of very high sensitivity and equine enterprise either high or medium sensitivity, depending on its significance on the farm (Table 3.1).

The EIS identifies a total of 12 No. equine enterprises within vicinity of the route, 5 no. in the CMSA (LCT 091, 107, 149, 223A and 232) and 7 No. in the MSA (LMC 023, 046, 058, 059, 099 and 132, 135[55]). Three of these landholdings are or have been stud farms:

[55] A number of other equine establishments, in respect of which observations were made, fall more than 200m outside of the route corridor. These have not been assessed by the applicant, which I consider to be appropriate, namely Moortown House, Donaghpatrick, Co. Meath; Derrypatrick House, Summerhill, Co.

- Drumhowan Stud (LCT 091) with the yard c.180m from the OHL.
- Rathnally Stud (LMC 046), with its main yard, >200m from the OHL but stabling possibly closer.
- Dunderry Stud (LCT 059) with yards 290m east and 50m west of the OHL.

The EIS assesses the impact of the proposed development on these holdings as slight adverse (see Appendix 3.1). However, having regard to the sensitivity of the industry to both the impact of OHLs on equines and on the visual impact of the OHL on the property, I would consider that this has been underestimated as the proposed development may restrict the use of the land as a stud farm. For example, in the case of Dunderry Stud where the OHL runs through 1.05km of the Stud's paddocks in a central alignment and in close proximity to one of its two yards. I would consider impacts may therefore be more appropriately rated as having a moderate to major.

For the industry as a whole, I do not accept that the development would have any serious adverse impact due to the small number of establishments affected.

With regard to the activities of hunt clubs and for those who exercise horses on local roads, I consider that the proposed development extends over a relatively narrow corridor that whilst inconvenient, it would be possible for clubs and riders to avoid public roads over which the line is proposed to be routed, without significant impact, if there were concerns regarding equine behaviour or rider safety.

5.8.5.7. Impact on Forestry

Observers draw the Board's attention to the loss of forestry as a consequence of the development and to the loss of income arising from same.

As stated the EIS indicates that there is a very small proportion of land within a 1km corridor of the route that is used for commercial forestry or is natural woodland. As a consequence, only eight land parcels in the overall study area are

Meath (Con Power); Bachelor's Lodge Equestrian Centre, Co. Meath; Bective Stud Farm, Co. Meath, Bloodstock enterprise, c.300m E of tower 311 (Dennis Nixon), Co. Meath.

identified as forestry enterprises, all within the MSA, LMC 067, 105, 110, 157, 170, 171 and 196 with LMC 135 a forestry and equine enterprise. As a consequence of the development 14.6ha of forestry will be cleared, with compensation to landowners for any losses incurred.

Appendix 3.1 predicts likely residual impacts with moderate adverse impacts on LMC 105, 110, 157 and 171 and major adverse impacts in respect of LMC 067 and 170, given the greater proportion of the forestry plot cleared (moderate impacts - 7.5% to 12% of forest, major impacts - 20% to 30% of forest). (Imperceptible impacts are predicted for the remaining two landholdings).

Having regard to the relatively small number of commercial forestry land parcels affected by the proposed development and the small area of forestry to be cleared over the entire length of the proposed development, I consider that the overall impact on commercial forestry in the study area is negligible. I also note that compensation is payable for any losses incurred.

5.8.5.8. Cumulative Impacts

A small number of parties refer to the cumulative effect of electricity infrastructure on the farming community

As discussed in this report, the proposed development intersects a number of existing 220kV and 110kV overhead lines, in addition to a larger number of lower voltage lines and telecommunications infrastructure. As noted, lower voltage lines and telecommunications infrastructure will be lowered in the vicinity of the proposed development. In view of this, some of the cumulative effects of the development on land use will be addressed (e.g. if lines are placed underground on a particular landholding), but I accept that local cumulative effects will still arise on a small number of landholdings.

5.8.5.9. Conflict with Policy

The proposed development, at a County level, by virtue of the temporary impacts during construction and permanent land take arising from the operation of the

proposed development, is at odds, in principle, with policies of the County Monaghan, Cavan and Meath development plans which afford protection to agricultural land, farm holdings, agricultural based activities, agri-food enterprises and forestry.

However, the proposed development comes forward as a key component of the national electricity transmission system. Route selection has sought to minimise significant impacts on a wide range of environmental receptors. Whilst the resultant alignment is routed through agricultural land, with local impacts for the farming community, these impacts are not considered to be significant at a county or regional level, primarily due to the low land take, continued use of lands under and in the vicinity of the line and the limited visual envelope. Furthermore, at a farm level it is considered that the applicant's proposed mitigation measures will generally address significant impacts arising.

In seeking to balance national objectives with local planning policies, it is considered therefore that the proposed development is acceptable and minimises adverse impacts on agricultural land and the farming industry in the area through which it is routed.

5.8.5.10. Site Specific Issues

During the course of the oral hearing numerous observers made submissions in respect of the impact of the proposed development on individual landholdings. Many of the issues raised were repeated across the submissions and have been discussed in detail above.

A small number of site specific issues remain and these are addressed below:

- Impact on Lough Egish Food Park - Lough Egish Food Park lies to the west of Lough Egish. It is physically removed from the proposed development and visually separated from it by topography. I do not consider therefore that the proposed development will adversely impact on it.
- Impact on Poultry Farms - A number of parties drew the Board's attention to an intensive poultry house and free range chicken enterprises at LCT 011/

012/013 and LMC nos. 111 and 116 in proximity to the proposed development. Having regard to the mitigation measure in place to manage construction impacts and the distance of the existing poultry houses[56] and external areas associated with these (where relevant) from the proposed development I would accept the slight adverse impacts predicted for these enterprises.

- Impact on Underpass - Landowner of land parcel LMC124 draws the Board's attention to the impact of the development on his ability to build an underpass for cattle linking his lands on either side of the N52. Tower 280 is proposed in land parcel LMC 124. It is situated c.50m from the edge of the carriageway within a large field, which the N52 adjoins. Whilst this is a matter which is beyond the scope of this application for approval, within this context, I would anticipate that an underpass could be readily provided in the remaining lands.

5.8.6. Summary and Conclusion

Key issues arising from land use include:

- Access to lands for survey work and the adequacy of the impact assessment carried out.
- Impact on the farming community and the rural economy.
- Impact on the 'clean and green' image of agriculture.
- Impacts arising on farms during the construction and operation of the proposed development.

Having regard to the methodology adopted for the assessment of land uses along the proposed alignment and the demonstrated reliability of the vast majority of the assessment made, it is considered that lack of access to lands for survey work is not an impediment to the applicant's assessment of the impact of the proposed development on land use.

Having regard to the relatively modest land take, the continued use of land for agriculture under and in the vicinity of the proposed development and the limited

[56] Including the new chicken house constructed in c.2011 at LCT 011/012/013.

visual impact of the development, it is considered that the proposed development will not adversely impact on the farming community, the rural economy or the clean and green image of agriculture. It is recognised, however, that the development may constrain the future development of McCormack Farms horticultural enterprise.

It is acknowledged that the construction of the proposed development (including the temporary use of access routes), and to lesser extent operation, will be a cause of inconvenience to the farming community. However, with the proposed mitigation measures, and conditions recommended below, it is considered that residual impacts arising from the construction and operational phases of the development will not be significant.

5.9. Human Beings – Tourism and Amenity

5.9.1. Environmental Impact Statement

Impacts on tourism and amenity are dealt with in Chapter 4 of Volumes 3C and 3D of the EIS. However, also relevant are:

- Chapters 11 and 14 of Volumes 3C and 3D which deal with Landscape and Cultural Heritage respectively, and
- Chapter 10 of Volume 3B which deals with interrelationships between Tourism and Cultural Heritage and Landscape.

Chapter 4 describes the existing environment for tourism and amenity, including key tourist attractions, visitor and recreational activities and accommodation providers. In addition to domestic tourism, in 2012, the EIS states that there were 126,000 overseas visitors to County Cavan and County Monaghan with associated revenue of €33m, and, 122,000 visitors to County Meath with associated revenue of €44m.

Construction impacts are predicted to arise from the visual impact of construction works and traffic disruption. Impacts are not considered to be significant, primarily due to the relatively short duration of visitor trips, typically transitory nature of tourists, linear nature of the proposed development, short term nature of works at any one location and the mitigation measures proposed (including sequencing of works relative to the main visitor season and the protection of water quality in respect of angling lakes).

For the operation of the proposed development, the EIS states that route selection has avoided significant adverse impacts on the key tourism assets in the study area. However, it concludes that for other tourist attractions and local amenities:

- The development will not directly inhibit any tourist and amenity activities along the route,
- However, the reduction in visual amenity of a local area may be perceived as reducing the attractiveness of an area.

Visual impacts and therefore indirect impacts on the associated tourism and amenity value of the area are predicted for:

- A short section of the Monaghan Way,
- Muff Fair,
- Some angling lakes close to the development (including Lough Morne),
- A short section of the Boyne Valley Driving Route (as the line crosses the route close to Bective Abbey and Gibstown),
- Bective Abbey, and
- Gibstown Drive-in Bingo.

The report considers that angling is not likely to suffer adverse impacts as a consequence of the development, as the attractiveness of this activity is more dependent on water quality and fish stocks.

Table 10.6 of Chapter 10 (Vol. 3B) refers to potential interactions between impacts and concludes that there may be a slight reduction in tourism spend and associated economic activity in the immediate areas where the proposed development will be located.

Chapter 4 is supported by the following drawing:

- Tourism accommodation, attractions and activities near the proposed development (Figure 4.1, Vol. 3C and 3D).

5.9.2. Policy Context

5.9.2.1. National Policy

The Department of Transport, Tourism and Sport's policy document *People, Place and Policy – Growing Tourism to 2025* (2015) sets out the government's long term vision for Ireland's tourism sector. Strategic goals seek to increase revenue from overseas visitors, increase employment in the sector and visitors to Ireland. Section 1.2 of the document acknowledges the important role of quality of the environment: -

> *'Notwithstanding the pressures of modern economic and social development, Ireland retains a longstanding and enviable reputation as a clean and green country, and many of our landscapes and seascapes, as*

well as our most significant built heritage, form a key part of our tourism offering. It is essential that the preservation and presentation of these assets is planned and delivered effectively'.

It acknowledges that developments which are clearly at odds with the prevailing quality of the natural environment and the rural and urban landscape are likely to damage the quality of visitor experience. With regard to energy infrastructure the document states that '*The very significant infrastructural investments required for our future energy needs, particularly linear infrastructure, requires careful management, with consideration of appropriate routes taking account of sensitivity of particular sites, routes and other potential tourism assets'*.

5.9.2.2. Development Plans

Monaghan County Development Plan 2013 to 2019

The Monaghan CDP refers to the underdevelopment of tourism in the County, recent initiatives to further develop the resource and the importance of protecting the county's natural resources, upon which much of which the County's tourism product is based. Policies and objectives of the plan seek to:

- Support the development of tourism (TMO2 to TMO17), and
- Resist development which fails to appropriately integrate into the landscape (with due regard to visual impact, landscape amenity, the protection of skylines, amenities such as lakes, designated walkways, heritage sites, recreational and tourist facilities) (LPP3).

Cavan County Development Plan 2014 to 2020

The Cavan CDP recognises the important contribution tourism makes to the County. Policies and objectives of the plan support:

- The development of tourism within the county (RTO5, RTO6, RTO9 etc.),
- Angling (RTP1-3),
- Walking and cycling (RTO3, RTO10, RTO17-22), and

- Seek to protect landscape, the natural and built environment and cultural heritage, that forms the County's tourism resource (RTO5).

Meath County Development Plan 2013-2019

The Meath CDP refers to the county's broad range of tourist attractions including its rich heritage, rural landscape and attractive towns and villages. Visitor attractions include the UNESCO World Heritage Site Brù na Bóinne, the Battle of the Boyne site, Trim Castle, Hill of Tara, Tailteann, Dunsany, monastic ruins at Bective and country houses and associated gardens. Policies and objectives of the plan of the Plan seek to:

- Promote the development of tourism within the County (policies ED POL 27, 28, 30-42,) and
- Protect and conserve the natural, built and cultural environment that form the basis of the county's tourism attraction (policy ED POL 29).

5.9.3. Issues raised by observers during the course of the application and during the oral hearing

The main issues raised by observers in submissions to the Board during the course of the application for approval and oral hearing may be summarised as follows:

- Impact on visitor attractions and local community events.
- Impact on angling.
- Impacts on the amenity of community facilities and the Gaeltacht.
- Impact on tourism related businesses (Trim Airfield and Irish Balloon Flights).
- Impact on landscape character and cultural heritage and the implications for tourism.

The applicant's response to the issues raised is contained in Chapter 11 of EirGrid's submission to the Board dated the 19th October 2015.

5.9.4. The Oral Hearing

Impacts on Tourism and Amenity were principally addressed in Module 1.12 on the 30th March 2016 (Day 12) of the oral hearing. Issues were also raised during Part 2 particularly in Modules 1.20 (Interest Groups), 2.3 and 2.4 (Specific Landowner and Public Issues).

Submissions were made by the following observers and by numerous individuals who raised issues of personal concern throughout Part 2 of the hearing:

- Toirleach Gourley, Senior Executive Planner, Monaghan County Council.
- Dymphna Condra, Tourism and Economic Development Officer.
- Elected representatives[57].
- Dr. Padraig O'Reilly, NEPPC.
- Aimee Tracey, NEPPC.
- James Bannigan, Lough Egish Rod and Gun Club.

In attendance for EirGrid were:

- Brian Murray, Senior Counsel.
- Ken Glass, Principal, Community, Tourism and Leisure, Environment and Planning, AECON.
- Brendan Allen, Senior Planning Consultant, ESBI.
- Des Cox, Senior Planning Consultant, EirGrid.
- Joerg Schulze, Senior Landscape Architect, AECON.
- Aiden Geoghegan, Project Manager, EirGrid.

5.9.5. Assessment

5.9.5.1. Impact on Visitor Attractions/Local Community Events

Observers draw the Board's attention to the impact of the proposed development on visitor attractions and sites of recreational interest within the study area, for

[57] Including Sean Conlon (TD Monaghan), Hugh McElvaney (Cllr. Monaghan), Peadar Toíbín (Sinn Fein), Noel French (Cllr. Meath), (Ronan McKenna (Cllr. Trim), Helen McEntee (TD Meath), P.J. O'Hanlon (Cllr Monaghan).

example, the Monaghan Way, Lough an Leagh, Hill of Tara, Trim, Bective Abbey, Boyne Valley Driving Route and Muff Fair.

The landscape and visual effects of the proposed development on specific visitor attractions and local community events are discussed in the Landscape section of this report. The proposed development has been routed away from the main tourist attractions but will give rise to residual landscape and visual effects for the following visitor attractions:

- A short section of the Monaghan Way, near Lemgare, Co. Monaghan.
- The scenic view from the public road to the south of the R181 at Shantonagh, Co. Monaghan (SV22),
- The Fair of Muff.
- The setting of a number of lakes in County Monaghan and County Cavan including Tassan Lough and Lough Morne.
- The scenic view from the public road north east of Cruicetown, Co. Meath (protected view No. 17),
- The scenic view from Bective Bridge, Co. Meath (protected view No. 86),
- Two short sections of the Boyne Valley Driving Route in proximity to Donaghpatrick and Bective Abbey.

In addition to the above, given the proximity of the proposed development to the location of Gibstown Drive-in Bingo (in the vicinity of Tower 303) and Dunderry Fair and Festival (in the vicinity of Tower 341), the development is also likely to detract from the setting of these visitor attractions.

The proposed development will not prevent the use of any of the visitor attractions. However, I would accept that it is likely to impact on the visual amenity of the attraction, detracting from is setting or view(s) and visitor experience. Where visual impacts are greatest, e.g. in the vicinity of Muff Fair, I would also accept that effects may also be more pronounced.

Notwithstanding this, having regard to the small number of visitor attractions which are affected, and in many cases the relatively modest impacts arising, I would consider that the proposed development would have a very modest impact on the extent and quality of tourist attractions on offer within the Cavan, Monaghan and Meath region as a whole.

5.9.5.2. Impact on Angling

Observers draw the Board's attention to the impact of the proposed development on angling resources, notably lakes and rivers occurring within proximity to the route, due to impacts on water quality and visual amenity. They also raise concerns regarding the safety of fishing in close proximity to the proposed OHL.

Monaghan County Council raised concerns regarding the impact of the development on angling in the Ballybay Castleblayney Lakeland area, both during construction and operation, as anglers tend to stay longer than, and, in the same area than typical tourist. They argue that impacts will arise from the visual impact of the development on loughs within the area, notably Lough Egish and Lough Morne, and when travelling between angling centres (e.g. Ballybay to Castleblayney).

Water Quality

I note that none of the lakes or rivers referred to by third parties are directly impacted on by the proposed development. The Board will note from the conclusions reached in the Water section of this report that water quality in lakes and rivers occurring in the study area, and therefore fish stocks, will not be adversely affected by the development, subject to implementation in full of all mitigation measures.

Visual Impact

The visual impact of the proposed development on loughs and river valleys is considered in the Landscape section of this report. It is considered that the

proposed development would detract from the setting of a small number of lakes, notably Tassan Lough and Lough Morne, in County Monaghan and on the River Blackwater and River Boyne in County Meath.

Whilst I would accept that anglers may dwell in a particular area for longer than a typical tourist, having regard to:

- The relatively short duration of construction work.
- The very small number of waterbodies which will be visually affected as consequence of the development,
- The modest nature of some of these impacts,

I consider that the proposed development is unlikely to adversely or seriously impact on the fishing experience of anglers in County Monaghan, Cavan or Meath.

Ballybay Castleblayney Lakeland Area

My understanding from material presented by Monaghan County Council at the oral hearing is that the main angling lakes in the Ballybay Castleblayney Lakeland area comprise Lough Egish, Shantonagh Lough, Lough Morne and Lough Nahinch.

As stated, it is likely that only one of these lakes is likely to be adversely affected by the proposed development i.e. Lough Morne. For this lough, Towers 166 and 167 will be c.250m from its eastern shore, and will be visible from the lake. Whilst I would accept that they would detract from the setting of the lake, they would not detract from the fishing experience on the lake itself, which as I understand is largely determined by water quality and fish stock.

With regard to travelling in the Ballybay Castleblayney Lakeland area, I would accept that the proposed development would be dominant in some views from the public road network and could reduce the attractiveness of the area to anglers.

Having regard to the above, in particular the limited impact of the development on the main angling lakes and the absence of direct impacts on the angling experience, I do not consider that the proposed development would significantly impact on angling in the Castleblayney Lakeland area.

Rivers

The proposed development would cross the Blackwater River and River Boyne in County Meath. Both stretches of river are fished (e.g. for salmon and brown trout) and I would accept that where the proposed OHL crosses the rivers, it would significantly detract from the visual amenity of the river environment for anglers. However, it is possible to somewhat address these impacts with off-site landscaping. This matter could be controlled by condition (see Reasons and Considerations).

Safety

During the course of the oral hearing the applicant acknowledged that the proposed development, like all OHLs, did represent a risk to anglers and that ESB included this target group in their efforts to warn the public of the dangers of electricity lines.

I would accept that in the majority of cases the proposed development is routed well away from fishing lakes and should not pose a significant risk to anglers. However, where the proposed development crosses the River Blackwater and River Boyne, I would accept that it may pose an additional significant, local hazard to anglers.

5.9.5.3. Impact on the Amenity of Community Facilities and the Gaeltacht

Impacts on the amenity of community facilities and the Gaeltacht are dealt with in the Human Beings – Population and Economic section of this report. Having regard to the distance of the proposed development from community facilities, it is considered that the proposed development, with the exception of the graveyard at

Dunderry and Oristown Church, will not have a significant impact on the amenity of community facilities in the vicinity of the route.
With regard to the Gaeltacht, whilst it is accepted that the proposed development is likely to detract from the amenity of the route corridor, impacts are not considered to be of such significance to give rise to secondary effects on land use, or therefore on the history or language of the area.

5.9.5.4. Impact on Tourism Related Businesses

Observers draw the Board's attention to the impact of the development on tourism businesses, notably Trim Airfield, Irish Balloon Flights, tourist accommodation and agri-tourism initiatives.

Impacts on Trim Airfield and Irish Balloon Flights are considered in the Material Assets – General section of this report. It is concluded that the proposed development is unlikely to significantly impact on the use of Trim Airfield, but may curtail balloon flights, under certain weather conditions. Reduced opportunities for flying, and of balloon events, could therefore potentially impact on this tourist related business, with possible consequences for tourist numbers and revenue.

With regard to accommodation and agri-tourism initiatives, I would accept that the proposed development could impact on the visual amenity of any such land use within close proximity of the proposed development. However, during the course of the application and oral hearing, there were very few examples of existing or proposed tourist accommodation[58] or agri-tourism initiatives which would be affected by the development. I would consider therefore that any significant effects on tourism, as a consequence of impacts on accommodation or agri-tourism initiatives, are unlikely.

5.9.5.5. Impact of the Development on Landscape Character and Cultural Heritage and the Implications for Tourism

[58] In this regard, I note the observer's submissions on the use of Rahood House, Co. Meath for tourist accommodation.

The observers draw the Board's attention to the impact of the development on the wider environment, notably that which:

- Hosts outdoor activities and rural cultural events, and
- Provides a broader context for tourism activities.

The observers refer the Board to the acknowledged close link between Irish tourism and the quality of the environment as demonstrated in Failte Irelands Annual Survey of Overseas Holiday Makers to Ireland and their policy document 'People, Place and Policy – Growing Tourism to 2025'). They argue that the proposed development will detract from the quality of the environment with consequences for:

- Its attractiveness to tourists,
- Income from tourist and jobs in the sector.
- Efforts to develop and/or promote tourism in the study areas (e.g. Failte Ireland's, *Ireland's Ancient East*).

Of note, Failte Ireland which state in their submission that it is the character of the landscape and the various aspects of the cultural heritage of the area, within the vicinity of the proposed development, that are the main tourist amenities which are pertinent to the proposed development. In response to the application for approval, they argue that the impact of the development on landscape character and its associated importance for tourism has been inadequately assessed.

Impact Assessment

I note that the applicant's impact assessment has had regard to Failte Ireland's Guidelines on the Treatment of Tourism in an Environmental Impact Statement, in the preparation of the EIS. Notably, it has identified the nature of the tourism resource in the region, the significance of the resource and the sensitivity of it, in particular with regard to potential visual intrusion. Individual environmental topics deal with impacts on landscape and cultural resources and Chapter 10 considers interactive impacts. Further, Section 11.3 of the Response document provides further comments on interactions between cultural heritage, landscape and tourism. It is my view that the impact assessment carried out, acknowledges the

link between landscape, cultural heritage and tourism and is adequate to identify and assess likely impacts arising.

Impact on the Wider Environment

As stated in the Landscape and Cultural Heritage sections of this report, the proposed development has been routed to generally avoid significant visitor attractions, landscape resources and important features of cultural heritage. However, as routed it would nonetheless:

- Adversely impact on a small number of visitor attractions and upstanding features of cultural heritage, and
- Result in significant landscape and visual effects, generally up to 600-800m from the alignment, but up to a distance of 1km in areas that are particularly elevated or open.

The development would create a new 'infrastructure corridor' through the typically rural landscape of County Monaghan, Cavan and Meath, and detract from the drumlin landscape of the northern part of the study area and the river valleys to the south. I would accept therefore that the proposed development would erode the quality of the environment of the area through which it passes, and consequently the broader context for tourism activities.

Notwithstanding this, I note that the width of 'landscape corridor' likely to be affected by the development, and therefore the extent of the wider environment likely to be affected by it, would be relatively modest, with significant visual impacts extending at most to c.1km either side of the route alignment. Further, it has been accepted that the proposed development, is of national importance and a key element of the country's electricity transmission network. Alternative routes and technologies have been investigated and the proposed development is generally considered to be the optimum solution for the interconnector.

Within this context, I consider that the impact of the proposed development on the natural and built environment (which provides a broader context for tourism), will

be confined to a relatively modest geographical area, and is unlikely to have a significant impact at county or regional level, and is therefore acceptable.

Ireland's Ancient East

The proposed development is located in the northern part of the area comprising *Ireland's Ancient East*, one of three of Failte Ireland's brand propositions for Ireland. Centred on the history (cultural heritage) and the landscape of the area, its objective is to *'offer visitors a compelling motivation to visit the East of our country.'*[59]

The proposed development is likely to detract from landscape character, within the environment of the route corridor, and from the setting of a small number of visitor attractions within the branded area (e.g. Bective Abbey, the Blackwater Valley at Donaghpatrick, Boyne Valley Driving Route). However, I note that the geographical area covered by the brand proposition is extensive, extending from the Border with Northern Ireland to Cork Harbour. Whilst I do accept that local impacts will occur, I do not anticipate that these would be of county or regional significance to impact on the brand *Ireland's Ancient East.*

5.9.5.6. Cumulative Impacts

Cumulative impacts, with regard to landscape and cultural heritage, are discussed in the Landscape and Cultural Heritage sections of this report respectively. For the reasons stated, it has been concluded that significant cumulative impacts may arise locally, for example, where the proposed development is visible and can be read in conjunction with other infrastructure or energy development. However, wider cumulative impacts are not anticipated, primarily due to the limited visual impact of the development, its narrow 'landscape corridor' and the lack of substantial inter-visibility between it and other infrastructure type development.

Similarly, where the proposed development can be seen with existing or proposed infrastructure, local cumulative impacts on tourism or amenity assets may arise,

[59] http://www.failteireland.ie/Ireland-s-Ancient-East.

for example, where the proposed development is seen with the existing 110kV OHL in the Teltown/Donaghpatrick/Gibstown area. However, again, due to the limited visual impact of the development, its narrow landscape corridor and lack of substantial inter-visibility between it and other infrastructure type development, I would consider that the proposed development is not likely to give rise significant cumulative impacts on the wider tourism resource of the county or region through which it passes.

5.9.6. Summary and Conclusion

Key issues arising in this section of the report relate to the impact of the development on visitor attractions, angling and the wider environment which hosts outdoor activities and rural pursuits and which provides a context for tourism activities.

Having regard to the routing of the proposed development away from significant tourist attractions it is considered that the proposed development will result in localised impacts on the setting of, or view from, a small number of local tourist attractions.

Impacts on angling are not considered to be significant due to the routing of the development generally away from lakes and rivers and having regard to the proposed mitigation measures to protect water quality. Visual impacts on Lough Morne are noted, together will local impacts on the Ballybay Castleblayney Lakeland area as anglers travel between lakes.

Whilst it is accepted that the proposed development will detract from the quality of natural and built environment through which it passes, which provides a context for visitor experience, the proposed development will impact on a relatively narrow corridor. It is unlikely, therefore, to significantly impact on the tourism resource, or visitor experience of, the three counties through which it passes, or *Ireland's Ancient East*.

5.10. Flora and Fauna

5.10.1. Environmental Impact Statement

Chapter 6 of the EIS's for the CMSA and the MSA (Volumes 3C and 3D) provides an evaluation of the potential ecological impacts of the proposed development on the flora, fauna and fisheries of the study area. It describes the studies and surveys carried out and the consultation with relevant stakeholders to inform the baseline ecology of the receiving environment. It evaluates the significance of the ecology of the area and identifies features of importance that may be sensitive to the proposed development i.e. Key Ecological Receptors. It describes the potential impacts (direct and indirect and cumulative) likely to arise and proposed mitigation measures.

Consideration has been given to known ecological sites that occur within 5km of the proposed alignment while more detailed assessment of ecological receptors has been undertaken within the likely zone of impact, which is deemed to be within an 80m wide corridor centred on the alignment.

The appraisal of potential significant impacts on the integrity of European sites arising from the development is considered in a Natura Impact Statement contained in Volume 5 of the EIS.

The following drawings support Chapter 6 of the EIS:

- Designated Conservation Sites (Fig 6.1 of the CMSA & MSA).
- Habitat Maps (Fig 6.2.1-6.2.18 CMSA & Fig 6.2.1-Fig 6.2.21 MSA).
- Whooper Swan Distribution (Fig 6.3.1 CMSA & MSA).
- Whopper Swan Distribution Flight Lines (Fig 6.3.2 CMSA &MSA).
- Earth Wire Line Marking (Fig 6.3.3-6.3.4 CMSA & MSA).

5.10.2. Policy Context

Each of the development plans for the individual counties contain policies and objectives to ensure that all development is carried out with due consideration for the protection of the natural environment including European sites.

5.10.2.1. Monaghan County Development Plan 2013-2019.

Policies and objectives regarding the protection of Biodiversity and Natural Heritage, Trees and Hedgerows, Wetland and designated sites within Co. Monaghan are contained in Section 4.6, 4.7 and Section 4.8 of the Plan. Of particular note are the following:

- *Biodiversity and Natural Heritage* - (Objectives BDO 1, BDO 3 and BDO 4 and Policy BDP 1),
- *Protection of Trees and Hedgerows* - (Policies THP 1, THP 2, THP 3).
- *Wetlands* - (Objective WLO 1 and Policy WLP 1)
- *Protection of Designated Sites* - (Policies DSP 1 and DSP 2)
- *Appropriate Assessment* - (Policies AAP 1 TO AAP 5)

Relevant appendices include the following: -

- Appendix 3 – Trees of Special Amenity Value.
- Appendix 6 – Proposed Natural Heritage Areas/ SAC/SPA's.

5.10.2.2. Cavan County Development Plan 2014-2020

Chapter 8 of the Plan seeks to protect, preserve and enhance the natural heritage and environment of the county. Relevant policies and objectives include:

- *Natural Heritage* - (Policy NHEP7 and Objectives NHE02, NHE03.
- *Protected Areas* - (Policies NHEP9 and NHEP10; Objectives NHEO4 and NHEO5).
- *Undesignated sites* - (Policies NHEP12).
- *Invasive species* - (NHEP15).
- *Wetlands* (Policy NHEP16 & Objective NHEO16).
- *Woodlands, Trees & Hedgerow* - (Objectives NHEO17 and NHEO 21).

Appendix 4 contains Natural Heritage Maps (Maps 1-15).

5.10.2.3. Meath County Development Plan 2013-2019.

Natural Heritage is addressed in Section 9.7 of the Plan. It is the aim of Meath Co. Council to protect, conserve and seek to enhance the County's biodiversity. Relevant policies and objectives include;

- *Natural Heritage* - (Policy NH POL1 and NH POL2 and Objectives NH OBJ 1)
- *European Sites* - (Policy NH POL 5 & 6 and Objective NH OBJ 2 & 3)
- *Protected Species* - (Policies NH POL 8 & NH POL 9)
- *Invasive Species* - (Policies NH POL 10)
- *Woodlands. Hedgerows and Trees* - (Policy NH POL 13, NHPOL 16, & NHPOL1 8).

Appendix 13 contains a list of the sites designated for Nature Conservation.

5.10.3. Issues raised by observers during the course of the application and during the oral hearing.

The issues raised regarding the impacts of the development on the flora and fauna may be summarised as follows: -

- Impacts on European Sites.
- Impacts on other sites of conservation interest.
- Impacts on protected terrestrial species.
- Impacts on fisheries and aquatic ecology.
- Impacts on birds.
- Impacts on trees/hedgerows.
- Impacts on invasive species.
- Lack of land access and reliance on pre-construction surveys.

The applicant's response to the issues is contained in Chapter 12 of EirGrid's submission to the Board of October 19th, 2015 (Response document).

5.10.4. Oral Hearing

Flora and Fauna was discussed in Module 1.14 on April 4th, 2016 (Day 14 of the hearing.

Submission were made by the following observers in Part 1

- Ms Shirley Clerkin, Heritage Officer (Monaghan Co Council).
- Dr David Tierney, Wildlife Inspector with NPWS (DAHG).
- Ms Irene Ward (Interest Groups Ballybay).
- Mr Neville Jessop (Brittas Estate).

During the consideration of Part 2 of the hearing various site specific matters were raised by observers regarding impacts on local flora and fauna.

In attendance for EirGrid were:

- Mr Jarlath Fitzsimons, Senior Counsel.
- Mr Stephen Dodd, Junior Counsel.
- Mr Daireann Mc Donnell, Senior Ecologist, TOBIN.
- Dr Patrick Crushell, Director and Senior Environmental Consultant, Wetland Surveys Ireland.
- Dr Maeve Flynn, Senior Ecologist, EirGrid.
- Mr Robert Arthur Senior Consultant (Construction), ESBI.
- Mr John Dillon, Senior Environmental Engineer, TOBIN.

5.10.5. Assessment

5.10.5.1. Impacts on European Sites

Issues have been raised in the submissions regarding the potential impacts from the development on European sites. It is contended that the proposal to cross the River Boyne and River Blackwater, which are both candidate SAC's is an unacceptable degradation of an asset that should be protected.

The location of all designated sites within 30km of the alignment is illustrated in Fig 6. 1 of Volume 3C and 3D Figures. It includes cSAC, SPA's, NHA's, pNHA and ASSI's in Northern Ireland.

There are no Natura 2000 sites close to the alignment within the CMSA. The nearest is Killyconny Bog cSAC, an area of raised bog located c11 km to the south east of the route. There is no hydrological connection between the European site and the proposed development. The site will not, therefore, be impacted directly or indirectly by the proposed development.

Within the MSA two Natura sites occur within 5 km of the proposed alignment, the River Boyne and River Blackwater cSAC and SPA. The River Boyne and River Blackwater cSAC is selected for habitats including alkaline fen and alluvial woodlands both listed on Annex 1 of the EU Habitats Directive. It is also selected for Salmon, River Lamprey and Otter, listed on Annex 11. The SPA is selected for Kingfisher (Annex 1 of the EU Birds Directive).

There will be no direct effects on any European site arising from the proposed development. No development will occur within the boundaries of any Natura 2000 site. No in stream works are proposed and no works will occur within the riparian zone. No vegetation clearing, or cutting will occur within the cSAC/SPA. There will therefore, be no direct effects arising from the proposed development on any European site. The towers will be at a remove and located over 50m from the river channels.

However, the proposed development will oversail two stretches of the River Boyne and River Blackwater cSAC/SPA designated site. This necessitates the construction of towers on either side of the river channel close to the cSAC boundary. The closest will be Tower 355 where the alignment crosses the River Boyne section. It will be approximately 6m from the cSAC boundary but 60m from the watercourse. Where the alignment crosses the River Blackwater section, the towers (Towers 309-311) will be positioned at various distances from the cSAC boundaries (84-191m).

Concerns were raised by observers regarding the proximity of Tower 355 to the designated site and its location up-gradient of the river channel. It was clarified during the oral hearing that the working area associated with Tower 355 would be positioned outside the SAC boundary. Mr Mc Donald (EirGrid), noted that there are no qualifying interests of the cSAC directly adjacent to the proposed works. Commenting on the woodland on an elevated bank close to the SAC boundary, he noted that it is located outside the floodplain and is not prone to flooding and would not, therefore, fall within the habitat classification of Annex 1 alluvial woodland.

Due to the proximity of the works, the construction phase of the development has the potential to result in indirect impacts on the cSAC/SPA. The impacts could arise from the release of sediments and other pollutants to the rivers, or the erosion of banksides with impacts on and disturbance to qualifying interests (Salmon, River Lamprey, Otter and Kingfisher). It was clarified by Mr Mc Donald (EirGrid) during the oral hearing that the towers on either side of the river channel will be constructed on agricultural land and not on peat, which minimises the risk of subsidence or slippage. Woody vegetation and general riparian areas will be avoided by the development and no tree cutting or bankside disturbance is required in the location of the river crossing points. There will be no disturbance to otter or kingfisher breeding sites as a result.

To mitigate potential impacts, best practice construction methods will be employed to minimise potential release of pollutants to the watercourses and to protect water quality. These will include the use of silt curtains as necessary, silt and hydrocarbon interceptor traps, precautionary measures to avoid spillages of contaminants (oils, fuels, concrete or cement), designated refuelling areas etc. These measures are standard mitigation measures for which the ESB have developed protocols.

A Construction Environmental Management Plan (CEMP), an outline of which is provided in Appendix 7.1 Volume 3B, will incorporate all necessary mitigation measures. An Ecological Clerk of Works (ECoW) will be employed during the

construction phase. The ECoW will monitor all construction activity in the vicinity of the River Boyne and River Blackwater and ensure the implementation and effectiveness of the proposed mitigation measures. All of these measures combine to reduce the potential for adverse impacts on the European sites. Provided these best practice measures are implemented and appropriately monitored, I consider that adequate protection will be provided to ensure that there are no adverse impacts on the cSAC/SPA or its qualifying interests.

I would point out to the Board that further consideration of the potential impacts on Natura 2000 sites is contained in the Natura Impact Statement contained in Volume 5 of the EIS, and is considered in more detail under below the Appropriate Assessment section of this report.

5.10.5.2. Impacts on other sites of conservation interest

Monaghan Co. Council acknowledged that the route and the towers avoids wetland features but consider that hydrological impacts should be considered for some wetlands including Bocks Lough, Corlea Bog and Raferagh Fen. During the oral hearing Ms Clerkin (Heritage Officer) stated that EirGrid's response to the issues raised by Monaghan Co Council was insufficient. She also expressed concern that some of the non-designated sites which are in close proximity to the line such as Greaghlone Bog (60m west of Tower 204), other than being listed, are not considered further in the EIS. There may also be sites where sub-surface hydrological movements will be affected by the installation of large concrete foundations.

Meath Co. Council refers to the Co. Meath Wetland Survey and highlights 6 no. towers (Tower No's 268,269,287,290, 292 and 297) and access routes potentially in wetlands.

It is also contended in the submissions that there will be catastrophic impacts on habitat/wildlife in the wider Cashel Bog Complex and that there is a weak ecological assessment of Drumgallon Bog. Ms. Irene Warde (observer) raised issues regarding impacts on Lough Major and Dromore wetland. Issues were also

raised regarding potential negative impacts on Tassan Lough pNHA arising from potential run-off of toxic lead laden water into the lake due to the proximity of the former Tassan Mine. Other concerns raised relate to impacts on Tassan Grassland, Lemgare Rocks and woodland adjacent to Bocks Lough.

The EIS considers designated sites (other than Natura 2000 network) north and south of the border within 5km of the alignment and beyond, where a potential for impacts is identified (Table 6.7). These include proposed Natural Heritage Areas (pNHA/NHA's) in Ireland and Areas of Special Scientific Interest (ASSI's) north of the border. It also assesses impacts on sites, which are not designated but are considered to be of ecological value (Table 6.8). Only those sites within I km of the alignment are considered due to their non-designated status.

The sites of ecological importance raised in the submissions are discussed below for the information of the Board.

Corlea Bog, Bocks Lough and Raferagh Fen

These sites are not designated but are identified in the EIS as of conservation interest. No towers will be placed within these sites but Corlea Bog and Raferagh South will be oversailed and it is contended by the observers that hydrological assessments should be carried out due to the proximity of the towers to these wetland features.

Corlea Bog is described as an area of cutover bog with regenerating fen communities and is evaluated to be of National importance. It is oversailed by the development between Towers 206 and 207. It is approximately 130m south of Tower 206 and approximately 30m northeast of Tower 207. Drainage from Tower 206 is towards the wetland area. Surface water from Tower 207 is to a drainage ditch that eventually flows into the wetland area.

Bocks Lough occurs c 100m east of the alignment between Towers 175-176. It comprises a lake, wet woodland and bog woodland and is considered to be of

County importance. Surface water run-off is towards the local road, which eventually drains to Bocks Lough.

Raferagh Fen/Raferagh Lough is as a wetland site, which comprises dystrophic lake, transmission mire, reed and large sedge swamp and marsh. Towers 197 and 198 are the closest to the lake/fen. The lake is approximately 100m east of Tower 198. Surface water run-off from the towers is towards the wetland and lough.

The towers will be located up-gradient of each of these wetland features. Surface water run-off is either directly towards, or, via a drainage system that eventually drains into the wetland feature. Surface water run-off will not be altered as a result of the construction of the towers. Sediment control measures will be implemented on the upslope and downslope of each tower to mitigate potential impacts. Having regard to the separation distance between the tower locations and the wetland features, the limited footprint of the tower foundations and the mitigation measures proposed to curtail the release of sediments, I accept that no significant hydrological impacts will arise, which would adversely impact on the features of interest in these wetland areas.

Greaghlone Bog

The cutover bog site is located 60m west of the alignment at Tower 204. It is described as comprising good diversity with wet Willow-Alder-Ash woodland and transition mire and evaluated as of County importance. The site was identified in the EIS (Table 6.8 Volume 3C) but not considered to warrant further assessment having regard to the scale and characteristics of the proposed development and the interest features of the site. There will be no direct impacts on the bog and subject to standard mitigation to curtail sediment migration, the proposed development will not impact on the ecological interest of the site.

Lough Nahinch

Lough Nahinch (which includes Cashel Bog) is also considered to be of National Importance. It contains a complex of habitats including lakes, extensive area of

poor fen, regenerating bog, scrub, wet woodland and mixed broadleaf woodland. The line oversails the very southern margin of the wetland site between Towers 117 and 118. Dr Crushell (EirGrid) in his evidence stated that Tower 118 will be constructed on mineral soil in improved grassland. With the exception of stringing operations, which will involve a person walking across the site carrying the nylon ropes, there will be no intrusion into the site during the construction stage and no impacts on the value of Cashel Bog.

Drumgallon Bog

Drumgallon Bog pNHA is described as a large cutover bog with secondary fen and other habitats extending north of the border (Druncarn Fen ASSI). The site is also stated to be renowned for its diversity of dragonfly species. In his submission to the oral hearing Dr Crushell (EirGrid) stated that the bog is an area of regenerating cutover bog. The nearest structure is Tower 109, which is located on an area of elevated ground, actively used for farming. The wetland is avoided by the development. With a separation distance of 600m to the nearest tower and the mitigation measures proposed to curtail the mobilization of sediments etc., during construction, I accept that there is limited potential for hydrological impacts on the bog habitat or the species it supports.

Tassan Lough

The closest designated site to the proposed development is Tassan Lough, a proposed Natural Heritage Area. It is described as a small lake that is noted for its bedrock geology with Silurian outcrops, which supports rare plant species. According to the EIS there is no potential for adverse impacts on the conservation interests of the site arising from the proposed development. This view is not shared by some of the observers who note the position of the pNHA relative to the former Tassan mine site and the potential for contaminants to be released into the water body as a result of the development.

The GSI Inventory of Mine Sites identifies the mine site to the south west of Tassan Lough, with a large solid waste heap on the west shore of the lake. According to the report, concentrations of lead and zinc in the sediments of streams draining the site are much higher than regional medians and suggest a direct input from mining. Very high concentrations of zinc have been measured in solid waste on the surface of the site. The Historic Mine Site-Inventory and Risk Classification published by the EPA and the GSI (2009), that classified mine sites which present the greatest threat to human and animal health and the environment categorised Tassan as Class V i.e. lower risk and not requiring any specific monitoring.

There will be no disturbance of the waste heap as a result of the proposed development, which would result in the mobilisation of contaminants as asserted by the observers. The closest tower (Tower 115) is located c 250 m to the north. Having regard to the separation distance between the tower site and the lough, the limited footprint of the development and the mitigation measures proposed to prevent mobilisation of contaminants, I do not consider that the potential exists for any adverse impacts on the conservation interest of Tassan Lough pNHA.

Tassan Grassland, Lemgare Rocks and woodland adjacent to Bocks Lough

Tassan Grassland is identified as a site of National Importance, described as holding an excellent example of neutral to acid grassland with abundant orchids. The line oversails the site between Towers 117 and 118. Impacts may arise from the lopping of higher limbs of mature trees along the eastern boundary of the site and the use of heavy machinery could damage the grassland surface. It is proposed to undertake works from the western side thereby avoiding the requirement to traverse grassland with heavy machinery.

Lemgare Rocks are noted to comprise an area of scrub in association with rock outcrop of Local importance (Higher Value), which the line oversails between Towers 107 and 108. It is not identified in the EIS as an area of specific ecological interest.

Issues were raised in the submissions regarding the removal of woodland adjacent to Bocks Lough. The woodland referred to is located c. 100m west of the woodland boundary associated with the lough. Any tree felling that is required will not impact on Bocks Lough. The woodland was visually assessed and no rare or protected flora and fauna species were recorded. Based on habitat quality it was considered that rare or protected flora at this location was highly unlikely. It is further noted in applicant's response that a survey of a larger stand of woodland at Bocks Lough did not record any rare or protected species.

Lough Major and Dromore Wetlands

In response to the issues raised by Ms Irene Ward (Observer) during the hearing, it was confirmed by Mr Mc Donald that Lough Major and Dromore wetlands to the west of the alignment close to Ballybay will not be impacted by the proposed development due to the separation distance of c 2.5km and the absence of hydrological connections.

Potential impacts/Mitigation

It is accepted in the EIS that the potential does exist for impacts to arise on sites of ecological interest during construction. Mitigation is achieved in the first instance by avoidance. No towers will be located in the wetland, woodland and grassland sites mentioned in the submissions, but some of these features will be oversailed by the development.

The construction phase may require temporary drainage (3-6 days) to facilitate construction. This could cause a secondary or indirect impact on adjacent wetlands by drying out of the surface. Arising from the location of towers on improved grassland, the separation distance to wetland features, the limited excavations associated with the individual towers and the limited duration of the works, dewatering is not expected to cause any material change to the water table. Any pumped out water would be allowed to percolate back into the ground adjacent to the excavation and accordingly no significant impacts are anticipated.

Addressing Monaghan County Council's concerns regarding the lack of assessment of subsurface hydrological movements and the potential for impacts on springs feeding the wetland features, Mr Dillon (EirGrid) in his submission to the hearing noted that the features referred to were located in a 'Poor' aquifer where there is limited potential for ground water flow. He noted that the sub-soils are of low permeability and consequently most movement is surface water movement. He confirmed that springs have been identified but that no towers will be located on spring locations. He noted that those springs associated with wetlands typically occur within, or, at the edge of wetland features, which are avoided by the development.

In response to the issues raised by Meath Co Council, it was confirmed that none of the 6 no. towers identified or associated access routes will be located in wetlands and all are located in managed farmland. It was noted by EirGrid that some of these locations may have been former wetland, but were subsequently reclaimed for agriculture.

In response to Monaghan Co Council's assertion that the applicant's response to the issues raised was insufficient, I consider that a comprehensive evaluation of both designated and undesignated sites within the study area has been carried out. I consider that the Board has sufficient information before it to allow it to assess the potential impacts of the development on these sites of ecological significance. Having regard to the limited excavations required for individual foundations, the limited potential for dewatering, the limited duration of the works and the separation distances to the towers, I do not consider that further information to include hydrological assessment of individual wetland features is required.

5.10.5.3. Impacts on protected terrestrial species

Issues have been raised in the submissions regarding impacts on protected species known to frequent the area, including badger, otter, bats, Marsh Fritillary Butterfly, Irish Hare and other wildlife species. Concerns have been expressed

regarding the low number of badger setts identified in the CMSA (6 no.) compared to 36 no. identified in N. Ireland. Other matters relate to destruction of bat roosts in barns, buildings and lands.

Impacts on badger

Badger and their setts are protected under the Wildlife Acts. They occur in various habitats but most frequently in areas of deciduous or mixed woodlands which are near farmland or open ground, but also use hedgerows.

Within both study areas details of badger activity was compiled from field surveys where possible. It was acknowledged by Mr D Mc Donald (EirGrid) that due to access difficulties there is not a complete data set. The information was supplemented by a data base on badger sett locations held by the Department of Agriculture Food and Marine (DAFM), which was compiled as part of the Bovine Tuberculosis eradication programme. Whilst the surveys do not cover all farms, it provided a useful database to allow EirGrid to avoid known sett locations (details are confidential).

Within the CMSA field surveys confirmed the presence of six badger setts, five of which were located no closer than 50m from the alignment, the sixth was located 24m from Tower 151. Within the MSA no setts were recorded but it is acknowledged that badger activity is widespread in the area.

I accept that the main impacts on badger populations are likely to arise during construction. The potential exists for destruction of setts and general disturbance of the species from human activity, noise etc. The main mitigation measure will be avoidance i.e. towers will be placed away from known badger setts and potentially suitable habitat (hedgerows and other woody vegetation). In other areas where badgers are confirmed (close to Tower 151) or are likely to occur (i.e. woody vegetation), pre-construction surveys will be carried out to confirm site clearance activities and a buffer zone will be established around any known badger sett. Works will require an agreed method statement and will be monitored by the

Ecological Clerk of Works (ECoW), whose responsibility it will be to ensure that the parameters for the protection of the species will be implemented.

During the course of the oral hearing, various observers noted the presence of badger setts in locations, which were not identified in the EIS. Mr P O' Reilly (NEPPC), for example, queried how a badger sett that existed within woodland on the Brittas estate in the vicinity of Tower 268 would be protected where trees will be removed. In response Mr Mc Donald (EirGrid) stated that pre-construction confirmatory surveys would be undertaken to confirm the status of the badger sett, whether it is active or active breeding and whether it lies within the actual works area. He stated that if the badger sett is not located directly underneath the tower foundations, there will be no requirement for the permanent destruction of the sett. There will be a requirement in this area to cut the trees down to a height of approximately 6m without the removal of any stump under the alignment. It is possible that the badger sett could be avoided in terms of direct removal or permanent destruction. Temporary closure of the sett or alternative mitigation under licence may be required by the NPWS under derogation.

There is a confirmed badger sett located in proximity to Tower 151. However, the destruction of this sett is not anticipated as the works are sufficiently far removed from the sett entrances. Standard mitigation would be employed i.e. confirmation pre-construction surveys will be undertaken at the sett location. All works to be undertaken at the tower location will be carried out under licence from the NPWS, due to the potential for disturbance.

In terms of derogation licences, Ms Cliona O Brien (DAHG) brought to the attention of the hearing Circular NPWS 2/07 and the requirement under paragraph 7 that an application for a derogation licence should be made in advance of seeking approval under the Planning and Development Regulations. She was not aware that EirGrid have made any applications for such licences, which leads to the bigger concern as to the adequacy of the information to fully understand the effects of the proposed development on the environment. In response Mr Mc Donald noted that Circular 2/07 is in relation to Annex IV species, which does not include badger.

I accept that the lack of access to land would have limited the information available on the presence of badger setts within the overall study area. I accept that it is likely, given the number of setts identified across the border involving a shorter section of the alignment, that additional setts may be identified prior to construction. This being said, as noted by Mr Mc Donald (EirGrid) the vast majority of the towers are located on improved pasture and agricultural land, at distances from suitable habitat. I also note that the NRA Guidelines for the Treatment of Badger[60] recognises that changes may occur to badger setts, level of usage etc., over time and recommends pre-construction surveys irrespective of the information identified in an EIS, to ensure mitigation measures are appropriate.

The species is not scarce and is widespread across the countryside. Having regard to the extended linear nature of the development, the limited access to land, I accept that there is potential for additional badger setts to be identified pre-construction. Provided the mitigation measures outlined in the EIS are adhered to, I do not consider that there will be significant adverse impacts on the species, its habitat or its setts.

Impacts on otter

Otter is protected both under national legislation (Wildlife Acts) and under the European Habitats Directive (Annex 11 and IV). It is found in a diverse range of habitats from small streams to large rivers, estuaries etc. While most tend to occur within the immediate area of riparian vegetation close to the streams and rivers, they can be found some distance from the aquatic environment. The presence of otter is relatively easy to identify. They are highly territorial, using spraints to mark their territory. The presence of otter will also be identified from glide marks into rivers and streams and by couches (above ground resting places) and holts (underground dens).

[60] Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes, NRA

Dedicated otter surveys were carried out at river and bridge crossings and along drains and watercourse where access to land was granted. Within the CMSA, no breeding sites or signs of otter were recorded, which may be explained by the fact that most watercourses are first or second order streams which have a narrow channel[61]. It is acknowledged, however, that the species is likely to occur along watercourses within the area. The towers are removed from the riparian zone which minimises potential for impacts and as noted in the EIS, there is an absence of suitable otter habitat in proximity to the tower locations within the CMSA. Within the MSA, signs of otter were observed at the River Boyne and River Blackwater close to the proposed line route crossing points. Evidence of otter breeding was recorded at one river draining into the River Blackwater (c.100m from Tower 309). It is acknowledged in the EIS that a number of areas with suitable breeding habitat will be crossed by the OHL (riparian river corridors).

The main threats to otter and their breeding sites would be from direct/indirect habitat destruction arising from clearance of bankside vegetation, changes to water quality effecting food sources etc. There will be no loss of aquatic habitat or barrier effect created by the proposed development which would result in a loss of access to foraging habitat.

Impacts are mitigated by avoidance, by placing towers, work areas etc. and in managed farmland away from suitable habitat (watercourses and associated semi-natural habitat). Impacts are likely to be minimal in the CMSA due to the absence of large watercourses favoured by otter. Within the MSA, 41 river crossing sites have been identified as potential otter breeding sites. Pre-construction surveys will be carried out at watercourses and adjacent habitats that occur within the corridor of the alignment to confirm the presence or otherwise of otter sites.

Subject to the mitigation measures proposed to protect water quality, the surveying of known and potential otter sites prior to the commencement of construction, and the establishment of an agreed methodology regarding the approach to be taken to protect any site identified, I consider that the impacts on

[61] The EIS refers to studies carried out in both Ireland and N. Ireland which found that otters are most likely to be associated with watercourses with a channel width that exceeds 2m.

the species or its habitat will not be significant. There are no operational impacts arising from the proposed development which would impact on otter.

Impacts on bats

The issues raised relate to impacts on potential bat roosts along the alignment. It is also contended that impacts on the species are not properly assessed.

All Irish bat species are protected under both Irish and European law and are listed in Annex IV of the EU Habitats Directive. Bats rely heavily on buildings for roosting but also use mature trees and woodland habitat.

Bat surveys were carried out as documented in the EIS and a number of species were recorded. Whilst bats were recorded foraging along rivers, hedgerows and linear woodland, the alignment avoids all known bat roosts in the area (provided by NPWS and Biodiversity Ireland). Contrary to the concerns raised by the observers, no sites with significant potential for bat roosts (caves, mine houses, mills, houses, bridges or other buildings) will be impacted by the development. However, the study area contains a large network of hedgerow, individual mature trees, treeline and woodland habitat that provides potential roost sites and foraging habitat and commuting routes for bat species.

The majority of the towers (over 90%) are located within improved agricultural grassland. However, some towers are proposed on boundary hedgerows and on treelines, which will result in direct loss of habitat in these locations. There will also be a requirement for some trimming and possibly lopping of woody vegetation at hedgerows and treelines underneath the proposed conductors to provide adequate clearance underneath the overhead line, which may impact on roost sites. These operations have the potential to cause injury or death to resident bats and destroy their roost sites.

The EIS for both study areas notes that no bat roosts were confirmed during the field surveys. I accept that surveys were limited and excluded areas such as

Brittas and other demesnes and their associated mature woodland habitat/treelines, which are likely to provide suitable roost sites. I also accept that bats may roost only temporarily in trees and that this gives rise to difficulty in detecting roosts.

I accept that where the alignment crosses mature woodland/treelines, felling or lopping operations there is has potential for disturbance/destruction of bat roost sites. This impact will be mitigated in accordance with established practice. Pre-construction confirmatory bat surveys will be undertaken on specific mature trees identified for felling. The surveys will be undertaken by a bat specialist and felling of trees with roost sites will only take place once a derogation licence has been issued from NPWS. I accept that the timing of felling operations i.e. to avoid periods of bat hibernation, breeding etc. minimises potential impacts on the species.

I accept that the routing of the alignment through agricultural pasture land and the avoidance of buildings, structures etc., minimises impacts on potential bat roosts. I accept that if full access to land had been granted, it is likely that bat roosts within mature trees and woodland would have been identified. I accept that the mitigation measures proposed which include pre-construction surveys and measures to mitigate impacts where roosts are identified in consultation with the NPWS are in accordance with standard practice and will minimise impacts.

Impacts on Marsh Fritillary Butterfly

Marsh Fritillary Butterfly is the only Irish butterfly listed in Annex 11 of the EU Habitats Directive. It inhabits a wide range of habitats but is mainly associated with wet grassland and heath habitat in Ireland. Its main food source is Devils bit Scabious, which is widespread in Ireland.

Marsh Fritillary was not recorded in the MSA study area and it is noted that typical breeding and feeding sites are avoided by the proposed development.

Within the CMSA, Marsh Fritillary has been recorded in Drumcarn Fen (the part of Drumgallan Bog that occurs in N. Ireland). Having regard to the separation distance to the alignment (600m), I consider that the alignment is sufficiently far removed from the alignment to avoid any potential impacts. No mitigation measures are proposed by the applicant.

Impacts on other protected fauna

The other protected species that occur include Irish Hare, Pine Marten, Frogs (Annex V) and species protected under the Wildlife Acts (Red Squirrel, Red Deer). These species are generally widespread throughout the country. The alignment generally avoids wet habitat suitable for frogs. Whilst some fauna such as Irish Hare and Pine Marten may be disturbed during construction activity, this will be temporary and there is an abundance of similar suitable habitats in the wider area into which the species can migrate. Having regard to the foregoing, I do not consider that any of these species will be significantly impacted by the development. No mitigation is considered necessary in the EIS.

5.10.5.4. Impacts on fisheries and aquatic species

The report from Inland Fisheries Ireland (IFI) highlights that the proposed development has the potential to impact on fisheries and specific catchments including the River Boyne and River Blackwater cSAC. It notes the emphasis on protecting watercourses within catchments of European sites in the outline CEMP and states that this protection should include all watercourses irrespective of their designation.

The DAHG states that An Bord Pleanála must ensure that the outline CEMP contains enough detail to allow a complete, precise and definitive appropriate assessment to ensure protection of water quality. Other issues raised by the observers relate to impacts on brown trout fisheries, spawning grounds and fish stocks, the efficacy of the mitigation measures proposed, impacts of EMF on migratory species such as salmon and the appropriateness of the development in close proximity to the River Boyne and River Blackwater cSAC.

Rivers, lakes, ponds will be avoided by the development and no instream works are proposed in any watercourse. The alignment will oversail a number of rivers and streams but no towers will be located in the riparian zone. Within the CMSA most of the watercourses oversailed by the alignment are small streams with channel widths of less than 2m. In the MSA larger rivers will be crossed including the River Blackwater and River Boyne, which are considered to be of international importance based on SAC designation.

It is acknowledged in the EIS that many of the watercourses are significant fishery areas and hold Salmon and Trout stocks as well as spawning and nursery habitat for both protected aquatic species (particularly Salmon, Lamprey species and White-Clawed Crayfish), all of which are listed on Annex 11 of the EU Habitats Directive), and for other species such as Trout.

There are a range of construction activities that have the potential to impact on watercourses and the sensitive aquatic species they support. Potential impacts could arise from increased sedimentation as a result of surface water run–off in the vicinity of the works and from accidental leakage/spillage of oil, fuel, concrete, cement, chemicals. There is also potential for impacts on water quality associated with felling of conifer plantations.

Mitigation is achieved by avoidance. All tower locations are located away from sensitive natural watercourses and permanent drainage features. All towers are located a minimum of 20m (CMSA) and 50m (MSA) away from major rivers and 5m away from other smaller natural watercourses. A drainage and sediment control plan will be implemented to mitigate potential impacts on water quality. It will incorporate standard best practice measures such as the installation of silt curtains on watercourses, provision of silt traps, fuel/oil interceptors, bunding of fuel storage areas, designated areas for refuelling, pouring of concrete etc. The drainage and sediment control plan will be part of the CEMP and the Ecological Clerk of Works will supervise its implementation and effectiveness.

The type of measures proposed are standard for construction activities close to/upstream of a watercourse for the protection of water quality and fisheries. The measures adhere to the guidance provided in the IFI publication[62]. It was confirmed by Mr Mc Donald (EirGrid) during the oral hearing that the mitigation measures applied to protect the River Boyne and River Blackwater c SAC will be applied to its tributaries and watercourses generally. Subject to the effective implementation of these measures, and consultation with IFI, as appropriate, I consider that the potential for impacts on fisheries, spawning areas etc. will be effectively mitigated.

Construction Environmental Management Plan

During the oral hearing, Ms C O'Brien (DAHG) raised issues regarding the level of detail in the CEMP, the mitigation measures proposed at individual tower locations and the efficacy of such measures. She noted the lack of site specific details. In response Mr R Arthur (EirGrid) noted that whilst the development was a large scale infrastructural project, the actual construction effort is relatively modest. He noted that the foundations associated with each leg of the tower are shallow and both EirGrid and ESB have considerable experience in the development and construction of such projects and in more sensitive sites (i.e. Donegal 110kV project and the recently completed Salthill Screen project).

He stated that the construction effort would be designed to minimise local ground disturbance. The towers are designed such that a difference in ground level can be accommodated from one side of the tower to the other. Where the gradient between the two legs is greater than 1m, the tower leg will be installed using a leg extension. He stated that there were only four locations within the overall scheme where the gradient is too significant to be overcome by the use of tower leg extension (Towers 164,166,168 and 207). These will require additional excavations above the standard foundations.

[62] 'Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites' (IFI)

Regarding the efficacy of the mitigation measures proposed, Ms O'Brien noted that NPWS did have a complaint regarding a pollution incident on the Donegal 110 kV line project. She noted that ESB did act quickly to resolve the issue and a report after the event detailed a number of key actions, one of which was that ESB should update their guidance on silt control methodology. She sought clarity on whether the mitigation measures proposed for this development are the ones that are updated to take account of the lessons learned.

It was clarified by Mr Mc Donald (EirGrid) that the incident referred to by Ms O' Brien was as a result of construction works undertaken on a wet deep peat soil within a pearl water mussel catchment. He noted that the conditions associated with the proposed development were different. Excavations would take place principally on agricultural land and on mineral soils, with no deep peat. The River Boyne/Blackwater do not have the same sensitivities, have been artificially drained and carry high levels of suspended solids under high flow conditions. The issues referred to in Donegal were due to the incorrect installation or the design of the silt curtains, which allowed water to flow underneath and sediment to escape. For clarity Mr Mc Donald referred to the NIS (Pg 101), which sets out the requirements in relation to the correct installation of silt barriers/silt curtains for the proposed development to prevent water discharging underneath or around the edge. Ms O Brien raised no further issues in this regard.

Dr Tierney (NPWS) expressed concerns regarding the final CEMP and its preparation by a contractor which may include the resolution of technical details and matters that could influence the nature and significance of the effects of the proposed development on the environment. It was made clear by EirGrid that all elements of the outline CEMP will be included in the final CEMP. It sets the minimum standards that must be achieved to ensure the protection of the receiving environment. Any additional measures that may be incorporated in the final CEMP as a result of conditions will provide at least the same or a better standard of protection. I accept that this is standard practice in construction projects and does not mean that an inferior level of protection will be provided. The final CEMP will be subject to ongoing review throughout the construction phase through regular environmental auditing and site inspection, to confirm the

efficacy and implementation of all relevant mitigation measures and commitments identified in the application documents. Its implementation will be monitored by the Ecological Clerk of Works (who will be a qualified Ecologist).

EMF and Salmon

Dr Andrews (observer) queried whether EirGrid had carried out any research on the effects of EMF on the navigational ability of Atlantic Salmon. He questioned whether the transmission lines would impact on their migratory behaviour and their ability to return to spawning rivers. He quoted from the WHO, which stated that no studies to date have adequately assessed the impact of EMF on migratory fish such as salmon and eels.

In response Mr Mc Donald (EirGrid) referred to research carried out in the US, which suggested that interference would not occur except at the mouths of natal streams. Once fish are in their natal streams, it is flow direction and olfactory senses that guide salmon to spawning grounds. He stated that there is no evidence that the grid network and associated EMF provides a barrier to salmon movement. Fish will move on the basis of their biological instincts and their instinct is not to stop in the middle of an unsuitable habitat on the basis of disturbance. He noted that fish encounter many disturbances such as around port facilities but continue their migration to spawning grounds. He quoted from various studies on the subject and noted that both the electric and magnetic fields would be attenuated by water.

Dr Andrews accepted that there are different conclusions drawn and suggested that a precautionary approach should be adopted even when supporting data is not complete. In response Mr Mc Donald noted that the Scottish Natural Heritage had undertaken and literature review on the potential effects of magnetic fields to aquatic species in the marine environment including salmon. He stated that the call for further research principally relates to marine development which may cause disturbance effects i.e. off shore wind energy projects, sub-sea cables which generate EMF into the aquatic environment itself. He concluded that there

is no evidence that any high voltage lines present a barrier. In terms of the fresh water within the study area he stated that there is no data to suggest that a cable crossing a water course of 10m or less within the study area will cause a barrier to salmon movement.

Appropriateness of the development close to a cSAC

The questions raised regarding the appropriateness of the proposed development close to the cSAC and the adequacy of the outline CEMP in terms of appropriate assessment are considered under the section of this report entitled Appropriate Assessment.

5.10.5.5. Impacts on birds

It is contended in the submissions that the least favoured route corridor was selected for Whooper Swan and that the route is located in an optimum area to pose maximum danger to birds, bisecting their roosting and foraging areas. Other matters raised relate to collision risk, quantification of risk, cumulative impacts, the efficacy of bird flight diverters as a mitigation measure and monitoring of their effectiveness.

Monaghan County Council consider that additional areas of the alignment should be marked with flight diverters and the observers raise issues regarding the lack of consideration of regularly occurring populations in the fields around Ballintra and observed flight paths in various areas. The DAHG raise issues regarding the lack of consideration of ex-situ impacts on migratory species on sites remote from the alignment such as the Wexford Harbour and Slobs.

Concerns were also raised regarding other species including Curlew and Peregrine Falcon, which is stated to breed on Lough an Leagh Mountain.

Reference was made to a recent decision by the Board to refuse permission for a small wind farm in Co Roscommon on the grounds of impacts on Whooper Swan (PL 20.243479).

The EIS provides details of the numerous breeding and wintering bird surveys carried out in the study area to establish the bird species likely to be present/frequent the area. Full year studies (2009, 2012, 2013 and 2014) were carried out in addition to winter surveys (2008, 2010 and 2011). The final reports (2014) on breeding birds and wintering birds are contained in Appendix 6.5 and Appendix 6.6 of Volumes 3C and 3D Appendices of the EIS. These studies update previous bird surveys carried out in the wider study area. I would also point out to the Board that during the oral hearing EirGrid brought forward additional bird surveys completed since the application was lodged. These include a 2015 breeding survey (Submission 17) and winter survey carried out over the winter of 2014/2015 for both study areas (Submission No's 18 & 19). Mr Mc Donald confirmed to the oral hearing that the latest surveys confirmed the results and overall conclusions of the data and evaluations set out in the EIS.

The EIS focuses on bird species of conservation interest (breeding and wintering) identified as being at potential risk from impacts associated with the proposed development (targeted species) due to collision risk, risk of disturbance and displacement, and, species distribution throughout the study area. In terms of breeding birds, Kingfisher was the only Annex 1 breeding bird identified as being potentially sensitive to the development. All other species which are either collision prone or sensitive to disturbance/displacement appear on the Red or Amber list of Birds of Conservation Interest compiled by BirdWatch Ireland.

Whooper Swan (Annex 1) was identified at an early stage as a species which is considered highly susceptible to collision with powerlines. Other species which have a high potential to collide with the OHL include Mute Swan, Cormorant, Great Crested Grebe and duck species.

Kingfisher

The Kingfisher's habitat is along rivers, riparian habitat and lakes. It is not a collision prone species but is sensitive to disturbance. It was not recorded in the CMSA but regularly noted along the River Boyne and River Blackwater and their tributaries in the MSA. Both rivers are designated as an SPA specifically for breeding Kingfisher. It was also observed regularly at Whitewood Lough (c. 600 m from the proposed alignment). According to Dr O Reilly (NEPPC), Kingfisher uses the River Dee corridor within the Brittas estate.

In his submission to the oral hearing, Mr Mc Donald (EirGrid) stated that Kingfisher's nesting habitat is within the banks of watercourses, where it requires vertical banks 70cmin height that are not subject to flooding. He stated that the species is under pressure arising from the extensive drainage maintenance works being carried out by the OPW on the River Boyne and River Blackwater. He stated that the proposed development will have nothing resembling the level of impact associated with the OPW's undertakings. He noted that Kingfisher feeds on small fry and fish species and despite the turbidity and high colour of the river waters, the species has maintained feeding despite the anthropogenic impacts on the catchment as a whole.

Regarding the presence of Kingfisher within the Brittas estate, Mr Mc Donald (EirGrid) confirmed that the potential exists for Kingfisher to use the River Dee corridor within the estate but that the proposed alignment does not interact with the River Dee and accordingly there is no potential for significant impacts.

I accept that impacts on the qualifying species will be mitigated by avoidance. No works are proposed in any riparian corridor and whilst the alignment will oversail the SPA there are no proposals to cut, lop, trim or clear vegetation or tree lines within the SPA. There will, therefore be no direct physical impacts on nesting/breeding habitat. I accept that there is potential for disturbance during the construction phase but this will be of a temporary nature. No significant impacts will arise once the development is operational as the species is not noted to be prone to collision with powerlines.

Whooper Swan

Whooper Swans are listed in Annex 1 of the EU Birds Directive and are known to be susceptible to collision impacts. The species are winter migrants generally arriving in October from Iceland and leaving for their breeding sites in March/April. Foraging/roosting sites are widely dispersed throughout Ireland and the swans generally move between foraging and roosting sites and between foraging sites.

At an early stage Whooper Swan was identified as a key target species requiring consideration in terms of potential impacts from the development. It is acknowledged in the EIS that while there may be some disturbance to the species during construction, associated with noise and activity, the main impacts will arise during the operational stage of the development. Swans are a species group susceptible to collision risk due to their low manoeuvrability and high wing loading. Birds in flight may collide with the conductors or earth wire, when moving from roost areas to feeding areas, or as they migrate through an area. There is also the potential for birds to be displaced from traditional feeding or roosting sites after installation of the new power line. In terms of collision risk, the earth wire has been identified as the main cause of collision, as it is located above the conductors and is thinner and more difficult to see.

Whooper Swan surveys were carried in the study area out over an eight-year period. Dawn/dusk surveys were carried out to target flight line, flock numbers, flight direction, height and duration. Two aerial surveys were conducted (2012/2013) using experienced ornithologists to locate, count and identify areas used by Whooper Swans in the wider area.

The surveys revealed that Whooper Swan is widespread across the study area. Within the CMSA, 56 sites were identified which were used by Whooper Swan. (Fig 6.3.1 & 6.3.2 of Volume 3C Figures). The most regularly utilised site close to the alignment in the CMSA was Lough Namachree with maximum counts of 65 swans (0.5% national population). Other sites of county importance included Lough Creeve and the fields at Ballintra. However, no site within the wider CMSA

study area exceeded nationally significant levels. Three areas were identified where flight lines occur, which cross the alignment.

Within the MSA 39 individual sites were identified as utilised by Whooper Swan (Fig 6.3.1 & Fig 6.3.2 of Volume 3D Figures). The key areas where swans concentrate and where flight line occur are in the Blackwater Valley (between Kells and Navan), Cruicetown, Balrath, River Blackwater (west of Kells) and Breaky Lough. The most significant area for Whooper Swan is the Blackwater Valley (between Kells and Navan), where nationally important populations overwinter. The swans in this area are noted to roost mainly at Headford Estate, which is away from the alignment and at Tara Mines Tailings Pond, where the flight line is bisected by the alignment.

Irregularly used foraging sites include an area oversailed by the alignment between Towers 309-310 (numbers at this site never exceed national importance) and farmland along the Yellow River area where numbers can reach close to national importance. Flight lines in this area are to Tara Tailings Pond and do not cross the alignment.

Highly dispersed irregularly used sites occur in the area between Mountainstown townland up to the N52 (Drakerath, Red Island, Clooney 2, Collaliss and Clooney Lough). Smaller flocks were noted as regularly foraging in various fields west of Clooney Lough (Collaliss and Clooney 2) and flight lines close to and crossing the alignment were observed in this area (Towers 280-281). Cruicetown is a foraging and roosting area for Whooper Swan. While the birds concentrate here, some spread out into different foraging area and to Whitewood Lough which requires flights across the alignment.

While key sensitive habitats for Whooper Swan are avoided as far as possible by the development, daily movements between roost sites and local feeding areas involves flight paths that cross the alignment. Crossing the alignment creates the potential for collision The areas where collisions are likely to arise were identified from flight lines recorded during the field surveys. Three areas are identified in the CMSA (Ballintra, Comertagh & Egish) and the MSA (Blackwater Valley, Clooney

Lough Area and Cruicetown). Mitigation will be introduced in these areas to reduce collision risk (Fig 6.3.3 & Fig 6.3.4 of Volume 3C & 3DFigures). The Yellow River site is also considered for precautionary mitigation due to its proximity to the alignment and the numbers that use the site (close to national importance), notwithstanding that flight lines observed were generally away from the alignment and towards Tara Mines Tailings pond.

It is considered in the EIS that is highly unlikely that the proposed development will result in substantial or profound impacts on Whooper Swan populations within the area. This is based on numerous field studies carried out which observed interactions between swans and geese and power lines. The field studies were conducted in various locations in Ireland, Northern Ireland and Scotland. The observations suggest that Whooper Swan may habituate to the power lines i.e. swans were observed flying over and foraging close by the transmission lines. Reference is made to Toome Bridge near Lough Neagh SPA which supports internationally important numbers of Whopper Swans, which regularly forage and flyover a 275 kV transmission line, constructed between 1963-1978. While occasional collisions are noted to occur, the area continues to support populations of Whooper Swan at favourable conservation status.

To mitigate the potential for collision where flightiness are likely to occur, it is proposed to install bird flight diverters on the earth wire. These will be installed along specific areas of the alignment where flight lines are stated to occur.

With regard to displacement from habitat, research and surveys indicate that Whooper swans continue to use sites close to existing transmission infrastructure. There is also an abundance of foraging habitat in the wider area.

Other birds

Other bird species identified as susceptible to collision include Mute Swan, Cormorant and Great Crested Grebe. The only area where precautionary

mitigation (flight diverters) is deemed necessary is between Lough Egish and Lough Morne where a Mute Swan flightline was observed during the bird surveys.

Suitability of bird diverters proposed

Issues have been raised by the DAHG and others regarding the efficacy of the line markers. It is stated that the design of the line marker is at odds with EirGrid's own guidance. Monaghan Co Council and DAHG raise issues regarding the appropriateness of the colour proposed in terms of visibility and suggests that high visibility diverters should be provided. It is also suggested by Monaghan Co Council that additional areas of the line should be marked. It was also queried whether the removal of the earth wire could be considered as a mitigation measure.

Dr Tierney (DAHG)) queried why orange spheres were proposed between Towers 355 -357, when yellow spheres were considered superior for reflecting light better at dawn and dusk and do not blend in readily with background colours. He also noted that Whopper Swans can migrate at night under non moon lit conditions and that the diverters proposed for this development are likely to be ineffective in such conditions.

It is proposed to use a grey PVC (UV stabilised) wired coiled swan flight diverter device. The areas and lengths of alignment proposed for marking are highlighted in Figures 6.3.3 and 6.3.4 Volume 3C & 3D Figures. In addition, coloured marker spheres will be provided between Towers 355-357 and will include the River Boyne crossing, for aviation purposes associated with Trim airfield.

EirGrid's own guidance, *Ecology Guidelines for Electricity Transmission Projects'* (2012), notes the various devices that can be used ranging from brightly coloured balls, thickened wire coils, luminescent, shiny or hinged or flapping devices. It is acknowledged that all of these options reduce bird collision by at least 50-60%, although the efficacy of line marking may vary between species and there remains uncertainty about the best performing marking device.

I accept that there is some merit in the argument that the chosen device appears to be the most innocuous of all and would appear the least likely to avert collisions, particularly at times of poor visibility. Whilst EirGrid state that a grey colour device was chosen as they retain colour (APLIC, 2012) [63], the DAHG, also making reference to the APLIC document which notes that *'the devices are also available in yellow with UV stabilizers that help to retain device colour'*. However, I also note that Dr Tierney referenced work by Crowder et al., 2000[64], who undertook an experiment to compare the two colours but did not come to a definitive conclusion regarding the effectiveness of yellow over grey and acknowledged that further research was required.

I accept that a review of the literature establishes that line markings are effective in reducing collision risk. Whilst there is no conclusive evidence on which colour is this best option, EirGrid have had regard to guidance and research carried out in respect of the Beauly-Denny 400kV project in Scotland, which had significant bird constraints. It passes through or close to a number of SPA's with an abundance and diversity of collision prone species and which support significantly larger populations. It concluded that the best all round markers are the type now proposed by EirGrid for the development. The devices used on the Beauly Denny 400 kV line are silver grey in colour and are the same model that is being proposed by EirGrid.

It is EirGrid's view that the 'thickened wire coil' device aligns with current best practice guidance, will increase the diameter of the line increasing its visibility and is technically suitable for installation on the earth wire of a 400 kV line. Mr Mc Donald (EirGrid) noted that the red markers (not orange as stated by DAHG) proposed at the crossing of the River Boyne are an aviation requirement but will also be effective as bird diverters.

I would draw the attention of the Board to the evidence given by Dr Meabh Flynn (EirGrid) at the oral hearing. She stated that disregarding colour, shape etc., bird

[63] Reducing Avian Collisions with Power Lines: State of the Art 2012 (APLIC. 2012)
[64] Assessment of devices designed to lower the incidence of avian power strikes Crowder, M.R. 2000

diverters have been shown in scientific studies and peer reviewed papers to be effective and there are significantly less bird collisions when they are in place. The effectiveness varies greatly depending on the site, the species, locations and topography. She stated that removing the earth wire as suggested by DAHG is not a practical solution in this case as the earth wire needs to be in place for the electrical security of the line.

She noted that EirGrid have been able to show from the surveys where the movements of birds cross the alignment and mitigation has been applied to those high risk areas. Grey is the standard colour for the type of device being proposed as the colour does not tend to decolour as quickly as red and yellow. She reiterated that the evidence suggests that anything that increases the diameter of the earth wire is effective and that contrast is more important than colour. Other deflectors like flapping devices and colour devices have been investigated but there is less information on the effectiveness of these. Moving and flapping devices which flap or spin around the wire require higher levels of maintenance and monitoring as they can clump together reducing their effectiveness.

Dr Flynn stated that the management and maintenance of the device proposed is less of a risk and provides the required profile visibility for birds passing in terms of contrast against the line. In response to questions from the Inspector, Dr Flynn stated that she was not aware of any locations where phosphorescent or devices that glow have been used. She noted that the use of such devices needs to be carefully considered as while they could be used to identify the line they could act as a target to draw species towards the line.

Dr Flynn also noted that the Beauly-Denny project is now operational and EirGrid are cognisant of the survey work carried out as part of that project and the mitigation measures used. It is a much bigger scale project and passes through more sensitive areas, which much bigger densities of bird usage, particularly winter birds. The elements of risk are far greater on that project and they have installed similar type bird flight diverters along high risk sections of the line. She confirmed that spiral diverters are in use on other 400 kV lines such as Shannon – Killaloe. It was a condition of the permission for Beauly Denny that on-going

monitoring be carried out. The results of that monitoring have not yet been released but will be informative in terms of the effect of their mitigation measures.

Collision risk

In their original submission to the Board, the DAHG stated that EirGrid should have attempted to put quantitative values on the number of fatalities that could occur (both alone and in combination with other developments) and whether this will give rise to significant effects on Whooper swan populations. EirGrid sought to address this concern in their response document (Section 12.3.1.5), noting that no model has been developed to date in this country to assess collision risk to birds from powerlines. Modelling data primarily from windfarms and from the Beauly Denny 400 kV line were reviewed to inform EirGrid's response. It is stressed in the response that the collision values are estimates only. It also evaluated bird collision impacts from the development alone and in combination with the Emlagh Wind farm, which in the interim has been refused permission. I note that a new application has been received by the Board which has a smaller footprint (Castletownmoor).

The collision rates detailed in the response are based on eight years of survey data and are estimated for Co. Meath only as flight lines in Co. Cavan and Co. Monaghan are too infrequent to estimate collision numbers. The collision rate assessment is based on an empirical model adopted and tested in the Beauly Denny 400 kV overhead line in Scotland. It utilised a collision rate value for Pink-footed goose. In a worst case scenario and without mitigation it is estimated that between 0.7 and 6.68 Whooper swan could collide the alignment/year in Co Meath. This collision rate is shown to be imperceptible and insignificant in the context of national populations counts, which are at favourable conservation status. Impacts on county populations are considered moderate and potentially significant, and stated to be unlikely to lead to an overall decline in Co Meath populations. However, these collision rates are estimated in the absence of mitigation and it has been demonstrated that mitigation in the form of line markings will reduce potential collision rates.

Mr Mc Donald (EirGrid) presented an updated version of the collision risk calculations to the hearing (Submission No 21). The calculations were re-evaluated using updated Whooper Swan census data made available following the 2015 IWeB Survey undertaken by BirdWatch Ireland, which was not available during the preparation of the response document. The values presented follow the same calculation procedures as outlined in the response document but use the empirical model collision rate index for Mute swan (Meyer, J.R.1978)[65], which is a higher collision risk than Pink-footed goose, documented in the original response. This collision rate was considered more relevant as the Mute swan have a more similar body shape, wing span and in flight manoeuvrability as Whooper swan. It also used a mitigation efficiency rating of 50% to 80% as opposed to the 90% efficiency originally used. This provides a more conservative and precautionary calculation.

Updated estimates were calculated for Whooper swan collision risk along regular flight lines in Co. Meath (Table 2 of the submission). The estimates are considered to be the worst-case scenario. The results of the national and county level population effects are presented in Table 3. These calculations identify a potential maximum localised impact on the Co Meath Whooper swan populations at these sites ranging from 0.1% - 3.33% (50% mitigation efficiency) and 0.04% - 1.33% (80% mitigation efficiency). Potential maximum localised impacts on the national Whooper Swan populations at these sites range from 0.00% - 0.05% (50% mitigation efficiency) and 0.00% - 0.02% (80% mitigation efficiency).

Mr Mc Donald (EirGrid) referred to a study completed by the Scottish National Trust (Trinder 2012)[66] where population impacts may arise if collision rates affect ≥ 4% of a Whooper Swan population. On the basis of the updated calculations, which are more conservative than the originals, under both the 50% and 80% mitigation efficiency scenarios, there will be no population level impact either in Co. Meath or national populations of Whooper Swan. He noted that at no point will

[65] Meyer, J.R (1978). Effects of Transmission lines on Bird Flight Behaviour and Collision Mortality.
[66] Trinder, M (2012). The potential consequences of elevated mortality on the population viability of whooper swans in relation to wind farm developments in Northern Scotland. Scottish National Heritage Commissioned Report No 459

the project exceed 3.3% impact on the Co Meath population at individual sites, even at the Tara Mines Tailing Pond where the collision risk would be the highest. He stressed that the calculations upon which the collision risk is estimated are precautionary using the maximum flock size recorded and no population level impact has been identified.

In response to questions from Dr Tierney, Mr Mc Donald estimated that in terms of bird numbers this would equate to 0.21 to 6.96 birds using maximum numbers and 50% efficiency and from 0.08 to 2.78 birds on an annual basis using maximum numbers and 80% efficiency. He confirmed that these figures are semi-quantitative and are for illustrative purposes and are also precautionary. Mr Mc Donald also drew attention to the wintering bird reports in Appendix 6.6 (Plate 4 and 5) which shows Whooper Swan feeding below 220 and 110 kV lines showing that the species swans habituate to the wirescape.

Dr Flynn (EirGrid) noted that there is no standard or bespoke type of collision risk model for birds and power lines, which is in contrast to other development such as wind farm. She noted that Scottish Natural Heritage are in the course of developing guidelines for birds and windfarms. The information available suggests that they will not and do not consider it appropriate that a similar type of collision risk model could be developed for power lines, as there are too many factors involved. The approach they recommend aligns with what EirGrid have done i.e. extensive surveys, multi-year surveys, identify flight line and mitigate appropriately. Models could be developed but for a particular area and for the species identified at risk i.e. not a one size fits all.

Monitoring

The DAHG suggest that in order to confirm the effectiveness or otherwise of the mitigation measures and to provide a greater understanding of the frequency of bird collision events with overhead lines, a targeted monitoring programme should be undertaken.

EirGrid have responded positively to such a proposal. The monitoring programme proposed will include mortality surveys at high risk areas carried out fortnightly to assess the number of fatalities arising from collision (with corrections made for scavenger removal, searcher detection bias etc.) It will also include flight activity monitoring surveys, WeBS surveys and vantage point surveys. These will provide information on any spatial or temporal shifts in bird abundance and distribution relative to baseline data. It will also determine whether additional sites require vantage point monitoring for flight activity based on any changes in the distribution of key species and whether additional mitigation is required.

There is no centralised database for collision data and the monitoring proposed by EirGrid will be advantageous in terms of accumulating information on bird movements, collision risk and the effectiveness or otherwise of the bird diverters. Should the Board be minded to grant approval for the development, I recommend that a condition be attached requiring an operational monitoring programme in accordance with the requirements of the DAHG.

In response to the matters raised by Monaghan Co Council submission that diverters should be considered in other areas, EirGrid confirmed that while other areas were considered, line marking was discounted on the basis that Whooper Swan flight line were not recorded over the eight year surveys or observations were very infrequent. Flight lines between various lakes were recorded away from the alignment and accordingly flight diverters were not considered warranted.

In response to the issues raised regarding changes in potential flight lines, it was confirmed by EirGrid that the distribution of the species is influenced by food availability, security from predators etc. and this will give rise to spatial and temporal shifts in Whooper Swan distribution which may result in changes in flight line and regularity. Post construction monitoring will take place for at least 5 years post construction to confirm the position remains the same.

Specific issues raised regarding lack of consideration of regularly occurring populations/ regular flight paths.

It is asserted by some of the observers that flight lines occur in other areas not identified in the EIS. Reference was made to the fields around the Ballintra area, which are stated are used every year by Whooper swan and not *'every other year'* as contended by EirGrid. I note that the information provided in the EIS is based on winter bird surveys and these suggest that the site is used irregularly (i.e. in some years) by county important populations. The birds cross the alignment from this foraging area to roost sites Tonyscallon and Toome (Crinkill) Lough) on the opposite side of the alignment. Line marking will be provided in this area to reduce the potential for collision.

Mr Gerard Brady (Submission No 32) queried the accuracy of the bird surveys and the conclusions reached in the EIS in the absence of access to lands. He noted that Whooper Swan (100 +) forage on his lands every year and the areas they congregate could not be seen from the public road due to the undulating nature of the landscape. It was confirmed by Mr Mc Donald while access to the lands was refused, surveying was conducted from vantage points on the public road and flight lines were recorded. A regular flight line occurs between Cruicetown and White Lough and line marking is proposed to reduce collision risk.

There is no evidence of Whooper Swan activity around Tassan Lough/Clay Lough. No significant flight lines were recorded in the Lough Nahinch area and any movement between Black Lough and White Lough would be in the opposite direction to the proposed development. It is acknowledged in the EIS that there is an irregular flight line between Lough Egish and Lough Mourne and other lakes to the west (which may include Boraghy Lake) and bird diverters are proposed as precautionary mitigation in this area.

In response to the suggestion by Monaghan Co. Council that additional line markings should be provided in additional locations, it was confirmed by EirGrid that the extensive bird surveys carried out provide details of flight lines and the regularity at which they occur. This formed the basis of the assessment of whether potential impacts will arise and the necessity for mitigation using line markings. Where observations were very infrequent or flight lines were away from the

alignment, bird diverters were not considered to be warranted, but that post construction monitoring would be undertaken for a period of at least five years to confirm this.

Ex-site impacts

In his submission to the oral hearing Dr David Tierney (DAHG) welcomed the fact that the proposed alignment avoids those SPA's designated for bird species that are potentially vulnerable to collision events as they fly between foraging and roosting areas. However, he noted that the birds associated with Ireland's SPA network are not continuously confined within such areas, and ex-situ impacts that may arise as a result of the proposed development on the relevant sites of the SPA network, must be subject to appropriate assessment.

He noted (Submission No 16) that birds migrate from Greenland, Canada and Iceland to the east and south east of Ireland and that these sites would need to be potentially screened against the ex-situ impacts arising from bird populations colliding with the proposed lines whilst on migration. He noted that in the southeast, Whooper Swan is listed as a special conservation interest for two SPA's, Tacumshin Lake SPA (Site Code 4092) and Wexford Harbour and Slobs SPA (Site Code 4076). Both these sites are considered to be of international importance for the species (Crowe et al., 2015). He noted EirGrid's response to the submissions where it is stated that there is no indication that there are migratory flight lines between the study area and Wexford Harbour and Slobs SPA. This lack of indication is based on reports by Griffen et al (2010/2011) that examined migratory routes of Whooper Swans overwintering in Britain and not Ireland. It was his opinion that the absence of evidence should not be considered as evidence of absence.

He also noted EirGrid's response to the submissions, where it was determined that the species migrating to and from northern countries would fly parallel to the proposed alignment thereby reducing the potential for collision. Dr Tierney made reference to Fig 3 of Submission No 16, which shows the tracked records of migrating Whopper Swans from England migrating across quite a large area of

Scotland en route to Iceland. Applying such as pattern of tracks originating from Co Wexford indicates that it is possible that birds overwintering in the south east of Ireland would cross the general area of the proposed interconnector.

He noted that the report by Griffen et al., 2011[67] reported on estimated flight heights of swans and geese over wintering sites in Britain. It states that Whooper swans fly quite low, with a median height of 42m flying over land. He states that the range of heights estimated from the tracked individual birds, overlaps with the conductor and the earth wires for the proposed development.

In his response to the matters raised, Mr Mc Donald stated that the potential for ex-situ impacts was considered in the screening assessment that was included as part of the NIS, and also in the response to submissions report. He noted that the information gathered by ornithologists in relation to this project allowed EirGrid to get an intricate and intimate picture of Whooper swan movements both within and outside the study area. It allowed EirGrid to build a picture of where these swans come from as they move in and out of the country during migration.

It is the baseline data, accumulated over numerous survey periods that have allowed EirGrid to reach the conclusion and be confident that ex-situ impacts can be ruled out. He stated that the information gathered during the bird surveys suggest that bird movements are of a local nature ranging in or around 5km and not extending as far as designated Natura 2000 sites. He noted the location of SPA's for which Whooper swans are designated which include Wexford Harbour & Slobs to the southeast, Lough Oughter to the west, Lough Neagh to the northeast and Lough Swilly. He was confident that the pattern of movement to/from Wexford Harbour & Slobs is in a north west to south east direction through the central portion of Ireland.

He confirmed in response to questions from Dr Tierney that EirGrid did not specifically survey Whooper swans in the Wexford Slobs, nor, did they undertake

[67] Griffin L Rees, E&B Hughes (2011). Migration routes of Whooper Swans and geese in relation to windfarm footprints.

a nationwide survey of movement of Whooper swans as they migrate through the island from Iceland through the island to the south east. The information is based on the extent of the field surveys undertaken within the wider study area/corridor where Whooper swan has been monitored over a period of eight years.

Dr Tierney returned to Figure 3 in his submission (Submission No 16) where he noted that Whooper Swan movements were not recorded in a straight line as they migrate from the UK to Iceland. He stated that whilst EirGrid asserts that Whooper swan will migrate to the west of the alignment, it could not be stated definitely that birds will not cross the line. It was his opinion that instead of concluding that there was no possibility of migrating birds being impacted by the OHL, that it would have been more accurate if some level of risk was provided.

Mr Mc Donald stated that there is no data set showing the movement of Whooper swan across the island of Ireland available to make this assessment. He stated that Figure 3 refers to Britain and is not relevant to the Irish situation other than the point where the migratory corridor widens from the originating site but that there are a number of potential deviations from the norm that have to be acknowledged but could not be modelled i.e. a wind storm event which could impact on movement. He noted that existing 110, 220 and 400 kV lines are being crossed each year by migrating bird populations, which in contrast to the north-south interconnector, cross the country at various orientations and there is no evidence that there are large mortalities of migratory swans as a result.

He re-iterated that the birds that have been identified in the locality of the route corridor are a local population and reoccur in the Monaghan, Cavan and Meath area and there is no possibility of significant adverse effects on the Wexford Harbour & Slobs and on Tacumshin SPA, which are at a distance from and removed from the development.

Mr Mc Donald stated that the primary consideration in the project was the potential for adverse effects associated with the proposed development. It was not on the qualifying interests of the SPA's remote from the site. However, the assessment includes the potential for significant impacts in relation to the localised populations

of Whooper Swan in the study area itself and in the wider study corridor where populations of county and regional importance have been identified. He contended that EirGrid has used the scientific evidence and information available which has allowed them to reach the conclusions.

Dr Meabh Flynn (EirGrid) referred to the gaps in ecological information in Ireland for various species and habitats. She noted that there is no standard data base and accordingly no firm indications of bird flight lines and flight paths across Ireland or mitigation patterns. Tagging studies would be the main way to identify those flight paths and the best way to conduct this would be an all-Ireland as opposed to project led approach.

Other matters

Reference is made in one of the submissions to a decision by the Board to refuse permission on the basis of impacts on Whooper Swan. This decision related to a proposal to construct 2 No. wind turbines in Co Roscommon (PL 20.243479). It was refused permission on the grounds that there was insufficient information to assess the impacts of the development on Whooper Swan, in light of conservation objectives including information on migratory routes and flight lines, having regard to the proximity of two SPA Natura 2000 sites. It would appear that in this case the nearest SPA was located c 5km from the site, with a greater potential for bird exchange and more significant impacts.

Regarding the assertion by NEEPC that the least favourable route was selected for Whooper Swan, EirGrid accepts that while impacts on Whooper swan are potentially highest on Route 3/3B in Co Meath, the risks to other ecological receptors are less significant compared to Route Corridor Options 2 and 1. I accept that impacts on Whooper swan is just one of many constraints that were considered by EirGrid in the route selection process and which informed the selection of the preferred route corridor.

5.10.5.6. Impacts on hedgerows and trees

The type of issues raised in the submissions relate to removal /damage to hedgerows and trees that are hundreds of years old, removal of hedgerows along temporary access routes, impacts of hedgerow trimming and the provision of compensatory habitat. It is also argued that physical inspection of hedgerows should be a pre-requisite. Specific issues were raised in relation to trees/hedgerow caused by corner Tower 109.

Impacts on hedgerows/treelines

The Board will note that the DAHG expressed concerns regarding the placement of towers on hedgerows in the original application. EirGrid took on board DAHG's concerns and the current proposal is to locate the towers off hedgerows as far as possible and in agricultural land to minimise interference/ loss and to preserve their ecological importance. The main mitigation measure adopted to preserve hedgerows/treelines in the study area is, therefore, avoidance.

Hedgerows form field and road boundaries close to the alignment. Each hedgerow along the alignment has been classified into either Type A (WL1 - Managed, which are generally less than 6m high) and Type B (WL1B - Unmanaged, which are generally less than 12m high). Their locations are indicated on the Habitats Maps. Treelines occur in association with hedgerows and as dense linear woodland, particularly in the MSA. Both habitats are important wildlife corridors and provide refuge and foraging areas for wildlife and nesting areas for birds. They may also provide roost sites for bats and may be utilised by badgers as suitable sett locations. The development plan for each county recognises the important contribution hedgerows and trees make to the natural landscape and biodiversity and each contains policies/objectives to protect and preserve these habitats.

There is potential for loss and damage to hedgerows/treelines during the construction stage associated with provision of towers, trimming/ lopping of vegetation under conductors to obtain adequate clearance, along temporary access route and at stringing areas/ guarding locations. Direct habitat loss will occur where towers are located on boundary hedgerows or treelines.

Within the CMSA, 5 no. towers out of a total of 126 no. will be located on boundary hedgerows and one on a treeline causing direct loss of habitat of 180m. Within the MSA the location of 13 no. towers (of a total of 142) on hedgerows/treelines will result in the loss of c. 390 m of hedgerow removal. The hedgerows/treelines that will be affected are assessed as being of low to moderate value. Vegetation will be removed to ground level and replanting will be carried out, which will allow re-establishment of the hedgerow in the gap where the tower is located.

I draw the attention of the Board to Appendix 6.3 of Volume 3C Appendices. It contains a *Benchmark Hedgerow Study* (2011) which examined the impacts to hedgerows/ linear woodlands on field boundaries at existing transmission tower locations in Co Laois and Co Kildare, considered to be relatively similar and comparable to the Meath section of the North-South 400kV development.

The findings of the study determined that locating towers in hedgerows leads to a range of localised ecological impacts including habitat fragmentation. It was observed that permanent hedgerow loss occurred at a high number of tower locations and that this was associated with past approaches to site clearance works associated with the construction of the towers. No hedgerow reinstatement/replanting occurred following completion of the works.

It concluded that these impacts can be reduced by ecological best practice approaches to site clearance and other mitigation. The recommendations include maintaining hedgerows as far as possible, protection during site works etc. Where removal is required the root structure should be retained and replanting is recommended in cases where complete clearance is required. The findings of the study informed the mitigation measures proposed for the current development.

Trimming and lopping of woody vegetation at hedgerows and treelines and in areas of deciduous woodland may be required between towers to provide adequate clearance beneath the OHL. This will be required where hedgerows exceed 6m in height. The locations where this will occur are in hedgerows which

are identified as of low to moderate ecological significance. The structure of the hedgerow/treeline will largely be maintained (i.e. the base and the shrub layer will not be affected) and the value of the habitat as a wildlife corridor will remain.

Impacts on woodland

There are also areas of woodland that will be traversed by the alignment which may require felling or lopping to provide adequate clearance beneath the conductors. Within the CMSA, seven areas are identified but only two will require vegetative management including a conifer plantation at Lisagoan (Towers 214-215) and Wet-Willow-Alder-Ash woodland at Tullyglass (Towers 175-176). In a worst case scenario where a 74m wide corridor is required, this would result in a 0.6 Ha loss of woodland. Both these areas have been evaluated as being of Local Importance (Lower Value) and accordingly the impact is assessed as negative and localised in nature.

Within the MSA, the felling of mature deciduous woodland will be required in a number of locations as identified in Table 6.17 of the Volume 3D. The largest area affected will be in Brittas estate, where potentially c 1.1 ha will be lost. Five smaller blocks (<0.1 ha) have also been identified at various sections along the alignment. The woodland is evaluated as of Local Importance (Higher Value).

Immature deciduous woodland at Brittas (1.2 ha) and six blocks of mature coniferous/ mixed woodland plantation woodland (10 ha), evaluated as of Local Important (Lower Value) will also be removed to obtain adequate clearance. According to the EIS and the evidence presented to the oral hearing, the level of clearance is a worst case scenario. It is tied specifically to the tree height and the potential for wind throw or falling trees crossing the alignment. The width of the corridor may be reduced as determined at detailed design stage as tree clearance will only be carried out if strictly required.

Impacts of clearance of woodland on Brittas

The clearance of mature woodland close to the entrance to Brittas estate was the subject of much discussion during the oral hearing. Mr Neville Jessop from the estate noted that the demesne consists of 350 acres of parkland, with c 80 acres of heritage woodland, 70 acres of new plantation and 200 acres of pasture land. He expressed his concerns regarding the removal of 1.1 ha of mature woodland (which includes lime, beech, ash and oak trees) to allow a maximum 74 wide corridor, which he stated would impact on the overall integrity of the demesne and its biodiversity.

In response, Mr Mc Donald (EirGrid) noted that the woodland within the area of the alignment and the wider area of Brittas estate was subject to a heritage woodland survey commissioned by NPWS. The mature area within the woodland was then subject to a second survey commissioned by NPWS and undertaken by Botanical Environmental Consultants (BEC). It identified the woodland within the main body of the estate as having a higher value which was then included in the National Survey of Native Woodland 2003-2008. The woodland through which the route will traverse was excluded from that native woodland due to the high level of non-native mature broadleaf species that occur, presence of invasive shrubs and the lack of diversity within the under-storey. It is of high local value but would not be of the same value as the mature woodland included in the National Survey of Native Woodland, which would be evaluated as of county be or national significance. It was stated that the site description and polygons which were delineated by BEC in completing their assessment were used in EirGrid's evaluation of the mixed broad woodland, which is not characterised as native.

Mr M O Donnell SC took issue with Mr Mc Donald's comments, querying whether there was any information on the age or number of trees and how a proper set of mitigation measures could be put in place without detailed knowledge of the woodland. Responding, Mr Mc Donald confirmed that access to Brittas was not granted and that impact significance was based on the character of the woodland, informed by the detailed woodland surveys carried out by BEC, views from the road and aerial imagery. Whilst there are some native trees in this area, there are

also non-native species and it and that is why it is classified as ‘mixed broadleaf woodland’.

I accept that the removal of the woodland will impact on the amenity of the estate. However, these impacts are highly localised, being largely confined to the demesne lands, which limits the potential for significant impacts on the public realm.

Removal of hedgerows/treelines along temporary access routes

In response to issues raised, it was clarified during the oral hearing that there are no proposals to remove hedgerows to facilitate the use of the temporary access routes. It was acknowledged by EirGrid that some of the access routes are narrow and overgrown and some trimming will be required. To minimise impacts on birds, hedge trimming will occur outside the breeding season. Hedgerows will not be removed to facilitate larger machinery on narrow lanes, as contended in the submissions. The type of machinery used will be dictated by the limitations of the route i.e. smaller dumper trucks will be used on very narrow routes.

In response to the concerns raised by Monaghan County Council, it is confirmed by EirGrid that the reference in the EIS to a clearance corridor of up to 74m refers only to areas of woodland and is not related to hedgerows.

Lack of physical inspection of hedgerows, treelines and woodland

The lack of physical inspection of hedgerows, tree lines and woodland is perceived by the observers as a constraint to the evaluation of impacts. I note that targeted surveys were carried out on those hedgerows and treelines that occur along the alignment where access to land was granted or where a good interpretation at a distance was possible. In other cases, LiDAR imagery was used (confined to 50m either side of the alignment), which is stated allows a good interpretation of the structure of hedgerows and their possible value as wildlife habitats.

I draw the attention of the Board to Appendix 6.4 (Volume 3C Appendices) which contains a study entitled *Intervening Hedgerow Assessment* (2012). It examines and quantifies the impact of the proposed development on hedgerows. It examines areas likely to be impacted by the construction of the proposed transmission line and was prepared to inform the ecological assessment contained in the EIS.

It classifies the hedgerow types that will be crossed by the alignment or impacted (i.e. included within 40 m zone of influence). The majority (80%) are typically less that 9m in height and did not contain obvious mature trees that would require severe cutting or removal (Type 1). Of the hedgerow types, 19% are categorised as Type 2, which typically contain at least one mature tree, that would require cutting/pollarding or removal. In all 10% were categorised as Type 3 i.e. continuous mature treelines, in which the majority, if not all, of the length of the zone of impact (508m) will be mature trees which will require cutting. The majority of these are located in the MSA.

I accept that while the hedgerow and tree heights may be reduced, their structure and function will largely be retained, which will preserve their ecological importance. I note that cutting of mature trees will follow TII Guidelines (formerly NRA) on the removal of treelines and hedgerows prior to construction. Whilst I accept that it would have been preferable if all hedgerows, trees and woodland were avoided, I do note that the alignment is routed primarily through agricultural land which coupled with the limited footprint of the towers minimises the potential for significant impacts.

Impact of Tower 109

One of the observer raised issues regarding the damaging effects on hedgerow resulting from the position of angle tower 109. The angle tower is located close to Lemgare where the alignment changes direction. It was confirmed by EirGrid during the oral hearing that the tower will be proximate to, but will not straddle a managed hedgerow (PE687-D141-150-001-001 Appendix 11.2 RVIA).

5.10.5.7. Potential impacts on invasive species

Concerns were expressed in a number of submissions regarding the potential for the spread of invasive vegetative species arising from the proposed development. The spread of invasive species is a growing problem in Ireland as the introduced species have the ability to spread aggressively and to out compete native vegetation.

The greatest potential for the spread of invasive species will arise during the construction stage as machinery moves from place to place along the extended length of the alignment. There is also the potential for impacts during trimming operations once operational. These activities could introduce new species into the local area and disperse species to new areas with significant adverse impacts on local biodiversity.

According to the EIS, only one invasive species has been identified in the study areas. This is Japanese Knotweed which is widespread throughout the country. It is commonly found along road edges and in the riparian area close to rivers/streams. It is highly invasive and difficult to eradicate. The species was recorded growing along the public road network in the wider study area but was not recorded during walkover/visual surveys of the alignment.

To mitigate impacts associated with the spread of Japanese Knotweed, EirGrid propose to adopt the guidance set out in the TII (formerly NRA) Guidelines[68] .The document sets out measures to control and manage invasive species during site

[68] Guidelines on the Management of Noxious Weeds and Non-Native Plant Species on National Roads (NRA, 2010).

clearance, construction and during maintenance operations. The has developed considerable expertise in this area arising from the significant road construction that has taken place over the last decade. Subject to compliance with its guidance and that appropriate controls are put in place, I consider that the development can be effectively managed to ensure that the spread of invasive species does not occur.

5.10.5.8. Lack of access to land and reliance on pre-construction surveys

The lack of access to land is raised in a number of submissions and questions raised regarding how an evaluation of ecological impacts can be undertaken in the absence of field surveys. The DAHG questions how significant ecological impacts will be handled post consent, which could have affected the Board's conclusions. It draws attention to Circulars of 2007 (PD 2/07 and NPWS 1/07).

The lack of access to land is acknowledged in the EIS as of the main constraints in the preparation of the EIS. However, it is EirGrid's contention that notwithstanding this difficulty, a comprehensive description of the baseline ecology within the study area is presented in the EIS.

Dr Patrick Crushell (EirGrid) outlined to the hearing the methodology used to evaluate the receiving environment. He noted that there were four main levels of survey undertaken.

The first was a desk top assessment using LiDAR imagery (50 m on either side of the alignment) and high resolution aerial photography was employed over the entire alignment. The second part of the assessment targeted significant ecological receptors (wetlands, woodlands etc.). It also included a desk top study and a review of third party data sources (published reports, baseline inventories GIS data sets, online mapping etc.) and consultation with key stakeholders including National Parks and Wildlife, Inland Fisheries Ireland, Bird Watch Ireland, and other bodies as documented in Appendix 6.2 Volume 3C & 3D Appendices. He noted that this level of information was expanding all the time with a lot of national surveys being undertaken in recent years by NPWS and other authorities.

The third level involved visual surveys from public roads and other accessible areas (38% of alignment) and finally level four involved field surveys were access was granted (25% of alignment).

It is noted in the EIS that in order to overcome the difficulties with limited access, and to ensure that appropriately robust appraisals were undertaken, a precautionary approach was adopted in the design of the proposed development. It was possible to confirm from the surveys conducted that the vast majority of the study area was not of significant value ecologically, being managed farmland. Where towers are required on lands that were not subject to field survey, tower locations were selected based on the presence of habitats of low ecological value (e.g. improved agricultural grassland), thereby minimizing the potential for impacts of significance associated with tower construction.

Dr Crushell produced a number of slides (Submission No 20) to the hearing showing how the various levels of survey were employed to build up a picture of the receiving environment. He demonstrated for example how LiDAR and high resolution aerial photography is used in the vicinity of Tower 144. It illustrates clearly that the tower is located within improved pasture. The hedgerows are clearly visible and the differences in colour in vegetation i.e. ash trees to the north and scrub type vegetation to the southeast and southwest. The next slide clearly showed yellow shading which was confirmed to be gorse in the hedgerows to the southeast and southwest.

The final habitat map created from the assessment provides a more detailed picture in the vicinity of Tower 144, which was subsequently subjected to both visual assessment and field surveys. It demonstrates that the agricultural grassland is the habitat classification (GA1) and the green lines around the field are hedgerows. More detailed information is provided on the hedgerows which were split into two different categories (WL1 and WL2). The green (WL1) are highly managed low hedgerows where the clearance would be sufficient and no hedge cutting or tree trimming would be required. In contrast the red (WL2) are unmanaged and may require trimming cutting if the exceed height of 6m below the conductors. The field surveys confirmed what had been indicated in the desk top

studies. The information provided demonstrates how the different data sets can add to each other and provide a more complete picture.

Dr Crushell also demonstrated how all levels of survey were employed in relation to Tower 216. In this case land access was available and the field surveys confirmed the information extracted from the desk top studies. He also illustrated how the desk top studies/data sources were employed in the vicinity of Cashel Bog /Lough Nahinch where land access was not available. In this case EirGrid had access to a detailed survey of this site undertaken in 2008 which would have informed the habitat assessment and appraisal. This together with LiDAR and high resolution photography informed the decision making process and ensured that whilst the line oversails the wetland, the towers are located outside. He expressed his confidence in the assessment despite having no land access in this case.

Dr Crushell informed the hearing that it was his opinion that EirGrid had sufficient access to adequately assess the impacts of the development on ecology. This, he said, was based on three considerations. Firstly, the majority of the line route is within managed farmland where significant semi-natural areas are scarce and can be avoided. Secondly, the nature and characteristics of the project means that impacts are localized and diffuse. Nearly all the works occur at tower locations with a minimal requirement for significant operations between towers that could potentially lead to impacts. Thirdly, the design of the project has avoided potentially sensitive areas and receptors with over 90% of the towers on improved pasture.

I accept that the design approach adopted in the design of the alignment was to avoid impacts. Towers are generally located on managed farm land of low conservation importance. The tower locations avoid designated sites, sites of ecological interest and semi natural areas such as wetlands, fens, raised bogs etc., mature demesne woodland/linear mature semi-natural woodland, sensitive hedgerows and treelines etc. No instream works are proposed and a buffer zone is maintained between tower sites and all natural watercourses. It avoids known badger setts, buildings and woodland that may accommodate bat roosts.

Mitigation is thereafter achieved by reduction through the implementation of measures to limit the potential for adverse effects e.g. the implementation of best practice and recognized measures to protect water quality, use of bird diverters to reduce the potential for collision effects on flight line across the alignment, siting of towers off hedgerows etc.

I consider, notwithstanding the limited access to land, that through the comprehensive survey effort conducted over an extended period that EirGrid has succeeded in providing adequate information on the receiving environment to facilitate assessment of the potential impacts of the development. No significant issues have arisen on foot of the observers' submissions or during the oral hearing which indicates gaps or inaccuracies in the information submitted in terms of designated sites/ sites of ecological significance. I accept, notwithstanding the unconventional approach to accumulating information, that no outstanding matters arise which would preclude the Board from making an informed decision on the application.

Circular's PD 2/07 and NPWS 1/07 makes it clear that consent authorities must have before them adequate information on the potential effects of a proposed development including any mitigation measures. It highlights the inappropriateness of the use of compliance conditions to complete an inadequate EIS, to ensure adequacy of information in an application having a potential impact on an SAC/SPA, or in either case to request the development of appropriate mitigation measures. Mr Fitzsimmons clarified the position, noting that confirmatory surveys would be carried out to ensure that before construction commences, the appraisal which is carried out and forms part of the application documentation, is merely confirmed before construction commences. This will take place even where land access has been obtained and is normal practice in relation to other linear schemes such as roads. It is not the intention of the applicant to carry out any evaluation post consent and this is made clear in the EIS.

5.10.6. Conclusion

The key issues arising in this section of the report relate to the impact of the development on the ecology of the area, including Natura 2000 sites,

Having regard to the routing of the alignment away from sites of ecological importance and primarily through agricultural land of low ecological significance, it is considered that the proposed development will result in localised impacts, which can be mitigated.

It is recognised that Whooper Swan is a key target species requiring consideration, associated with collision risk during the operational stage of the development. Having regard to the mitigation measures proposed, it is not considered that the proposed development will result in impacts which would compromise local or national populations.

It is accepted that the impact associated with the removal of trees/woodland will be most significant in the Brittas estate. Having regard to the nature of the woodland, its evaluation as being of 'Local' interest and the absence of significant impacts in the public domain, on balance it is considered the impact is acceptable having regard to the overriding need for the proposed development.

Notwithstanding limited access to land, it is considered that through desktop studies, use of GIS data bases, consultation with relevant stakeholders and through the employment of advanced survey techniques such as high aerial photography, LiDAR imagery etc. supported by field surveys and vantage point surveys that it has been possible to conduct a comprehensive ecological appraisal of the proposed development, which is considered is sufficiently comprehensive to allow the Board to carry out an assessment of and make an informed decision on the application.

5.11. Soils, Geology and Hydrogeology

5.11.1. Environmental Impact Statement

Impacts on soils, geology and hydrogeology are dealt with in Chapter 7 of Volumes 3C and 3D.

For both the CMSA and the MSA each chapter describes the existing environment by reference to published data sources and identifies potential impacts and residual impacts after mitigation. For both study areas, impacts arise primarily as the consequence of the construction phase of the development.

For the CMSA, the proposed development passes through a predominantly drumlin landscape with limited areas of peat occurring in the inter-drumlin hollows. Potential impacts include those on ground and geological conditions with the proposed use of temporary access routes, excavations for foundations and use of guarding locations and stringing locations. Piled foundations may be required at 9 locations where poor ground conditions occur[69] and 19 temporary access tracks[70] will be used (aluminium road panels or rubber matting) at a number of tower locations where temporary access tracks cross over areas of cutover peat and alluvial soils and if weather conditions are very poor. The proposed development passes close to two sites of County Geological Interest (Lemgare Mine and Tassan Mine) with possible impacts on subsurface remains and the risk of contaminants.

For the MSA, the development passes through an undulating lowland with occasional gravel hillocks, eskers and alluvial flats. Potential impacts arise from construction of the development. Piled foundations may be required at five locations[71] (due to the presence of cutover peat and lacustrine deposits) and approximately 5 temporary access tracks[72] where the OHL crosses cutover peat, lacustrine soils or alluvial soils and if weather conditions are very poor. Five sites of geological interest, all proposed as County Geological Sites, are located along

[69] Tower Nos. 104, 105, 106, 117, 119, 120, 122, 163 and 187.
[70] For temporary access roads to Tower Nos. 103, 104, 106, 116, 117, 119, 120, 123, 126, 130, 168, 180, 181, 202, 222, 223, 229 and 232.
[71] Tower Nos. 269, 279, 287, 292 and 379.
[72] For temporary access tracks to Tower Nos. 269, 279, 287, 292 and 379.

the route alignment (Altmush Stream, Gibstown Castle, Boyne River, Galtrim Moraine and Trim Esker). Tower 261 is located within the boundary of Altmush Stream CGS and Tower 381 within the boundary of Galtrim Moraine CGS. Tara Mine, near Navan, is the main mining area adjacent to the development

The EIS considers that construction may give rise to silt laden run off, accidental spillage of petrochemicals from machinery on site and may locally impact on groundwater flow and quality (e.g. if groundwater is encountered in tower excavations). Having regard to the proposed mitigation measures (Section 7.6, Vol. 3C), including the following, residual impacts arising from construction are considered to be negligible and short term:

- Avoidance of impact at route selection stage (e.g. known areas of lacustrine deposits, intact peat, cutover peat),
- Reuse of in-situ material,
- Consultation with GSI for works in vicinity of County Geological Sites,
- Minimising footprint of excavation,
- Storage, management, movement and reuse of construction waste (and any contaminated waste arising) in accordance with regulations,
- Good housekeeping practices in respect of hydrocarbons,
- Monitoring of any wells within 100m of tower sites (if dewatering), and
- Management of sedimentation in discharge waters.

Due to the absence of on-going interaction with ground and geological conditions, operational residual impacts are considered to be negligible.

The following drawings support Chapter 7 of the EIS (Vol. 3C and 3D, Figures):

- Sub-soils (Figures 7.1 to 7.4).
- Bedrock Geology (Figures 7.5 to 7.8).
- Aquifers (Figures 7.9 to 7.12).
- Vulnerability Maps (Figures 7.13 to 7.16).
- GSI Heritage Maps (Figures 7.17 to 7.20).

5.11.2. Policy Context

5.11.2.1. Monaghan and Cavan County Development Plans

The policies of Monaghan County Development Plan 2013 to 2019 and Cavan County Development Plan 2014 – 2020 afford protection to the county's geological sites (policies GHP1 and NHEP13 and NHEP14 respectively).

5.11.2.2. Meath County Development Plan 2013-2019

Policies of the current Meath County Development Plan also to protect the county's geological heritage (Policy NH POL 12).

5.11.3. Issues raised by observers during the course of the application and during the oral hearing

Issues raised by observers in response to the application for approval and at the oral hearing can be summarised under the following headings:

- Technical inadequacies in the EIS.
- Impact of development on, and implications for development of, existing and future mining operations.
- Impact on sites of geological interest.
- Contaminated Land.

Issues raised in respect of water and the disposal of spoil and contaminated material are dealt with in the Water and Material Assets – General sections of this report, respectively.

The applicant's response to the issues raised is contained in Chapter 13 of EirGrid's submission to the Board dated 19th October 2015.

5.11.4. The Oral Hearing

Issues arising in respect of soils, geology and hydrogeology were principally addressed in Module 1.15 on 15th April 2016 (Day 15) of the oral hearing. Issues were also discussed in Module 1.8 (Construction) and 1.16 (Material Assets).

Submissions were made by the following observers in Part 1:

- Dr. Colin Andrews (Professional Geologist).
- Mr John Paul McEntee, Executive Chemist, Monaghan County Council.
- MrToirleach Gourley, Senior Executive Planner, Monaghan County Council.

During the consideration of Part 2 of the hearing a number of individuals and landowners raised site specific issues, including Morris McAdam who raised issues in respect of historic mines.

In attendance for EirGrid were:

- Mr Jarlath Fitzsimons, Senior Counsel.
- Mr Stephen Dodd, Junior Counsel.
- Robert Arthur, Senior Consultant (Construction), ESBI.
- John Dillon, Senior Environmental Engineer, TOBIN.

5.11.5. Assessment

5.11.5.1. Technical Inadequacies in the EIS

The observers, in particular Dr. Colin Andrews, draw the Board's attention to a number items which are considered to constitute inadequacies in the Chapters on Soils, Geology and Hydrogeology in the EIS (Vol. 3C and 3D), for example, competency of author(s), misuse and inaccuracy of terminology, the inadequate baseline information (e.g. identification of contaminated land, depth to bedrock) and resultant assessment.

I note that the soils, geology and hydrogeology sections of the EIS have been prepared by staff which included professional geologists[73] and that its content and format reflect the guidelines on the preparation of the soils, geology and hydrogeology section of an EIS published by the Institute of Geologists (*Guidelines on the Preparation of the Soils, Geology and Hydrogeology Chapters an EIS*, IGI, 2013).

Consistent with the guidelines, the soils, geology and hydrogeology section has been prepared in conjunction with other specialist studies and has had regard to consultations with statutory and non-statutory bodies including the Geological Survey of Ireland. Baseline conditions have been established primarily from reference to published data sets, but with some additional information gathered from site walkover survey, vantage point survey (of adjoining lands) and shallow augering. Potential impacts on the geological environment (and the effect of this on the applicant's ability to construct the proposed development) have been identified and assessed.

As discussed previously in the Construction section of this report, it is considered that the applicant has demonstrated that the survey methodology adopted is sufficient to predict ground conditions for the design of foundations.

Having regard to the above, I am satisfied that the soils, geology and hydrogeology sections of the EIS is adequate to identify and predict the likely impacts arising on this environmental receptor as a consequence of the development.

5.11.5.2. Impact of Development on, and Implications for Development of, Existing and Future Mining Operations

The observers draw the Board's attention to their concerns that the applicant has inadequately assessed the impact of the development on historic lead mines in north County Monaghan. Specifically, they refer to mine collapses in recent years

[73] As stated by John Dillon (EirGrid), day 15, oral hearing.

on lands in proximity to the proposed development[74] (including on land traversed by the alternative proposed access route to Tower 109 – set out in the applicant's submission No. 51 to the hearing). They argue that there is the risk of collapse of old mine workings, and disturbance of unknown mine shafts related to Lemgare and Tassan mine, with tower construction and the use of temporary access routes to construction sites. The observers sought clarification on who would be responsible for any damages arising as a consequence of interference with historic mines.

In addition to the above, the observers argued that the applicant had (a) inadequately considered the impact of existing mines on the proposed development and (b) the impact of the proposed development on existing and potential mines and sand and gravel resources.

Historic Mines

The proposed development lies in the vicinity of five historic mines, Coolartragh, Lemgare, Lisdrumgormly, Annalogh and Tassan.

The disused Coolartragh lead mine lies c. 650m south west of the proposed overhead line between Towers 104 and 105. The mine is no longer in existence and has been quarried out (see OSI historic 6" black and white maps and Figure 1, Volume 3B).

The abandoned Lemgare lead mine lies c.50m to the north east of the proposed overhead line (Tower 108). The GSI's County Geological Site Report, in respect of the site describes it as follows:

> *'The Lemgare Pb deposit was mined briefly and apparently unproductively in 1840–41 along a single 150m-long adit that ran from north to south. Waste dumps mark the area of the adit portal and the air shaft sunk on the southern*

[74] Observers cited small collapses on lands in the Coolartragh area (vicinity of LCT-005) and in the Lemgare/Lisdrumgormly/Annalogh area (vicinity of LCT-008, LCT011, LCT-012, LCT-013, LCT-014, LCT-017)

end of the adit. The mine structures are filled in or obscured and the main interest at the site is the mineral assemblage recorded in the waste dumps'.

Historical maps would suggest that the features referred to above are contained within the designated Lemgare CGS and neither the proposed development or access routes for the construction of the proposed development extend within the boundaries of the designated site (see applicant's submission to the oral hearing, No. 70). However, the observers contend that there is a risk that workings extend outside of the CGS boundary and in this respect they refer to correspondence from both the GSI and EPA which states that the CGS site boundaries do not necessarily capture the full extent of a feature or that the EPA's Disused Mine Sites 2009 capture every mine site respectively (see submission Nos. 68 and 68A from Dr. Colin Andrews).

Lisdrumgormly mine lies east of Lemgare lead mine[75] and therefore further east of the proposed alignment. Annalogh mines lie over 200m from the proposed development to the south east of Tower 110. Neither are identified as County Geological Sites. Lisdrumgormly is referred to in the GSI's Report on the Geological Heritage of County Monaghan (GSI, 2013), with mining for lead taking place in the 1830s and 1950s. The report also refers to a collapse of a shaft in 2012 which was subsequently backfilled and fenced. No construction activity is proposed in the vicinity of either of these mines.

Tassan Mine was historically the largest of the County Monaghan lead mines and lies c. 170m south east of Tower 117. The County Geological Site boundary includes the surface features including a large solid waste heap on the western shore of Tassan Lough and the old office and workshop building. The CGS Site Report states that '*the lack of any clear trace of the shafts marked on old 1:10,560 sheets suggests a need for caution regarding visits given the potential for future shaft collapse*'. There is no reference to mine workings extending outside of the CGS boundary and no construction works are proposed in the vicinity of the mine.

[75] GSI's Report on the Geological Heritage of County Monaghan (GSI, 2013) – map on page 21 showing location of mine sites.

Further, historical records indicate that there are no shafts in the vicinity of Towers 116 or 117.

From the information which is available on the application file, including the material submitted by the observers at the oral hearing, it would appear that the proposed overhead line is routed away from any known historic mine sites or associated workings. However, having regard to the information presented on collapses in areas somewhat removed from known sites, and the possibility of workings occurring outside of identified or mapped areas, I consider that it would be prudent for the applicant to carry out appropriate geophysical survey of all proposed tower sites occurring within this north Monaghan area (i.e. for Towers 103 to 118).

With regard to the proposed temporary access routes, these follow established laneways or traverse agricultural land which would appear to be used by agricultural machinery. Further, I note the applicant's intention to use 'agricultural scale' equipment and on this basis I would not be unduly concerned regarding the efficacy of these proposed routes. However, to be prudent the Board may wish to impose a condition requiring geophysical survey of the proposed access routes in the vicinity of Towers 103 to 118.

Indemnification

With regard to indemnification, I note the IFA/ESB *Code of Practice for Survey Construction and Maintenance of Overhead Lines in Relation to the Rights of Landowners (1985)* indemnifies landowners against all losses arising from the works associated with the construction of the proposed development.

Existing Mining Operations and Future Reserves

During the oral hearing Dr. Colin Andrews drew the Board's attention to:

a. The possible impact of existing mining operations on the proposed overhead line. For example, he referred to the underground works

associated with Tara Mines and the possible instability of foundations arising from the effects of blasting (vibration) and dewatering (Fig. 7 and 8, Appendix 11, NEPPC submission on application for approval),

b. The impact of the proposed development on the future operation of existing or proposed mines (e.g. Tara Mines, Monaghan gold deposits), and
c. The possible impact of the development on sand and gravel deposits for example in the Boycetown area and in the Moynagh-Kilmainham-Muff area.

The proposed development traverses the existing underground extraction area of Tara Mines. In response to the matters raised by observers, the applicant stated that the design limit of the proposed overhead line was considerably in excess of the PPV[76] vibration limit set for the operation of Tara Mines. In view of this I would not anticipate any significant impacts on the proposed development as a consequence of blasting associated with the mine.

With regard to dewatering, the proposed steel lattice towers require relatively modest foundations with limited ground intrusion. The applicant's desk top survey, walkover survey, vantage points survey and shallow augering (where carried out) found no evidence of substantial ground stability issues in the study area, nor have they been alerted to any by statutory bodies or mining companies. It would appear therefore that ground stability issues are unlikely to be a significant issue for the proposed development.

I note that the applicant consulted with mining companies in the area (including Tara Mines and Conroy Gold) and that no submissions were made by these parties in respect of the proposed development. I would infer from this that mineral operators did not consider that the proposed development would impact on existing operations or their ability to exploit mineral resources in the future.

During the oral hearing the parties discussed the impact of the proposed development on geophysical survey (i.e. interference with remote sensing equipment). Whilst it was agreed that the development may impact on airborne

[76] Peak particle velocity is measures in mm/s and is a vibration indicator used for assessing annoyance to humans or damage to buildings.

geophysical survey there was disagreement regarding the extent of impact on such survey work. Further, the applicant drew the Board's attention to the extensive existing transmission infrastructure in the State and alternative survey methodologies (e.g. borehole and directional drilling), which can be carried out in close proximity to an overhead line. I would consider therefore that whilst it is possible that the proposed development would interfere with remote geophysical survey, impacts are likely to be relatively modest, given the relatively narrow route corridor, and could be addressed by alternative survey methodologies.

With regard to sand and gravel deposits, I note that the proposed development does not impact directly on any existing operation. Whilst policies of the respective development plans seek to protect mineral reserves, the proposed development comprises a very small geographical footprint and is unlikely to have any significant impact on sand and gravel reserves within the application area.

5.11.5.3. Impact on Sites of Geological Interest

The observers raised issues regarding the impact of the proposed development on sites of geological interest, in particular Altmush Stream County Geological Site (CGS) and Galtrim Moraine CGS through which the proposed development passes.

County Monaghan CGS

The proposed development passes close to two CGS in County Monaghan, Lemgare CGS and Tassan CGS.

Lemgare CGS comprises the disused workings of the Lemgare lead mine. The proposed OHL runs in a north west to south east alignment c.50m to the south west of Lemgare CGS. Tower 108 is the closest tower to the site, c.60m from the CGS boundary (Figure 1, Vol. 3B). No towers, construction sites or temporary access roads are proposed within or on lands adjoining the CGS.

Tassan CGS similarly comprises the historic remains of the Tassan lead mine. The proposed development runs in an approximately north east to south west alignment, c.145m to the north west of the site (Figure 2, Vol. 3B). Tower 117 is the closest to the site, c.150m from the CGS boundary. Again no towers, construction sites or accessed roads are proposed within or on lands adjoining the site.

County Meath CGS

In County Meath, the proposed development passes close to five CGS, Gibstown Castle, Boyne River, Trim Esker and through two sites, Altmush Stream and Galtrim Moraine.

Gibstown Castle CGS lies co. 1.5km to the east of the proposed development to the east of Tower 307 (Figure 7.18, Vol. 3D). It is a very small site and at this distance, and no towers or construction works are proposed within or in the vicinity of the CGS.

The north eastern edge of the Boyne River CGS is oversailed by the proposed development between Towers 354 and 357. However, no physical works occur within the area of the CGS (Figure 7.19, Vol. 3D).

The proposed development is also routed through the Altmush Stream CGS (Figure 7.20, Vol. 3D). Tower 261 is located within the boundary of the CGS itself. The main interest of this site comprises the natural well exposed outcrops along the banks of the Stream. Tower 261 is located c.20-30m from the stream and its banks (Figure 18, Volume 3B).

Galtrim Moraine is described by GSI as a partially wooded, much quarried moraine ridge (Figure 7.20, Vol. 3D). It crosses a second CGS, Trim Esker and its importance is described by the GSI as *'Prior to its extensive quarrying in the 1960's, the Galtrim locality was the only place worldwide where an esker was seen to cross a moraine'.* Tower 381 is located in the moraine on agricultural land, c. 800m north east of where the moraine crosses Trim Esker. The proposed

access routes to this tower and Tower 382 traverse the CGS, again at distance from where the moraine crosses the Esker (Figure 32, Volume 3B).

The Geological Survey of Ireland (GSI) is a division of the Department of Communications, Energy and Natural Resources and under their Geological Heritage Programme, they aim to document and support the protection of geological and geomorphological heritage in the country through, amongst other things, the identification of County Geological Sites.

In the course of the application, the applicant consulted with GSI and no concerns have been raised regarding the proposed development. However, a number of mitigation measures have been proposed and these include on-going consultation with GSI, limiting excavations to tower sites, maintaining an adequate distance from Altmush Stream and notifying GSI about any new feature exposed in the tower footprint.

Having regard to:

- The location of towers either outside of the above CGSs or removed from key features of importance,
- The proposed mitigation measures, including the use of agricultural scale vehicles to access tower sites,
- The absence of concerns by this statutory body, subject to the implementation of mitigation measures

I would have no concerns regarding the impact of the proposed development on the geological interest of the above sites.

5.11.5.4. Contaminated Land

The observers draw the Board's attention to the absence of site specific information on contaminated land and the requirement for additional survey work. They also raise concerns with regard to arrangements for its disposal.

I note that the applicant's assessment of contaminated land has been derived primarily from desk top research, for example, historical Ordnance Survey mapping, aerial photography and LiDAR, and from walkover survey where access was granted. In principle, I would accept that this survey work (using the source, pathway, target model) has identified the most likely sources of contamination e.g. from reclaimed quarries, railway lands etc. The development is proposed primarily in agricultural land, however, I accept that given the limited site investigations carried out, the excavation of soils from tower sites may reveal further potential contaminants. Section 7.6 of the EIS (Vol. 3C and 3D) sets out the applicant's methodology for evaluating and disposing of potentially contaminated soils, should they occur at foundation excavation stage, with disposal in an appropriate licenced facility. The approach is consistent with good practice and if it is implemented should adequately deal with any contaminants arising.

5.11.5.5. Impact of Temporary Access Routes

Having regard to the mitigation measures proposed in respect of the use of temporary access routes (as discussed in the Construction and Traffic sections of this report), it is considered that the use of temporary access tracks to construction sites, guarding locations or stringing areas will not give rise to significant environmental effects on soils, geology or hydrogeology receptors.

5.11.6. Summary and Conclusions

The key issues raised in respect of this topic include the adequacy of technical assessment, the impact of the development on mining operations (past, current and future) and sites of geological interest and the occurrence and disposal of contaminated waste.

Having regard to the preparation of the Soils, Geology and Hydrogeology Chapter of the EIS in accordance with guidelines provided by the Institute of Geologists of Ireland and EPA, the limited physical footprint of the proposed development, the limited ground excavations associated with the construction of towers and to the information on ground conditions in respect of towers sites (considered in the Construction section of this report), it is considered that the EIS is not deficient

and has provided sufficient information to identify and assess the likely environmental effects arising from the proposed development.

Whilst the proposed development is generally removed from any known historic mining operations, having regard to the information presented by observers on collapses somewhat removed from known areas of operation, the Board may consider that geophysical survey of tower sites and access roads to towers 103 to 118, is required prior to the commencement of construction.

Having regard to the location of the proposed development generally removed from County Geological Sites or from features of importance (in respect of Altmush Stream and Galtrim Moraine), the absence of concerns raised by GSI and the mitigation measures proposed, it is considered that no significant impacts on this County Geological Site will arise.

Having regard to the survey work carried out, the identification of likely sources of contamination and to the mitigation measures proposed for the disposal of any contaminated waste arising, it is considered that no adverse impacts are likely to arise from contaminated land as a consequence of the development.

5.12. Impacts on Water

5.12.1. Environmental Impact Statement

Chapter 8 of the EIS for the CMSA and the MSA (Volumes 3C and 3D) describes the hydrological environment and evaluates the potential impact arising from the construction and operational phases of the proposed development. The hydrogeological environment is discussed in Chapter 7 (Volumes 3C and 3D).

The principal construction works proposed are set out in Chapter 7 (Volume 3B) and an outline Construction Environmental Management Plan (CEMP) is included in Appendix 7.1 (Volume 3B Appendices). These should be read in conjunction with Chapter 11 of Volume 3B 'Summary of Mitigation Measures'.

The following drawings provide details of the water environment:

- Aquifer Maps (Figures 7.9 - 7.12 Volume 3C & 3D Figures).
- Vulnerability Maps (Figures 7.13 - 7.16 Volume 3C & 3D Figures).
- Regional Surface Water (Figures 8.1 – Fig 8.4 Volume 3C &3D).
- Drains/streams (MT-004-MT-0072 Volume 1B Drawings).

The surface water features in proximity to the alignment are described in Chapter 8. Baseline conditions have been established through a detailed desktop study and consultation with relevant prescribed bodies such as the EPA, IFI, GSI, EPA, local authorities etc. Site visits facilitated recording of drainage patters, drainage ditches, recording of hydrological conditions and visual evaluations of watercourses and watercourse crossings.

Within the CMSA, no major rivers are crossed by the proposed line route. A number of small rivers/streams traverse the study area and the proposed alignment is within the catchment of a number of major lakes (Egish, Bocks, Crinkill, Morne etc.) and some more minor lakes or ponds (Tassan, Muff, Raferagh etc.). There are no riverine SAC/cSACs in the area, but rivers along the line of the route are potential salmonid streams. The majority of the river catchments are 'at Risk of not achieving Good Status' in relation to Surface Water (1a status) under the Water Framework Directive. A review of monitoring station results compiled by

the EPA suggest that, in general the majority of the rivers along the alignment are slightly too moderately polluted 2012/2013.

Within the MSA, the River Boyne, River Blackwater and River Dee dominate the surface water environment. There are also a number of small rivers/streams in the area that traverse the study area/alignment (Tolka, Clady, Bective rivers etc.). It is located within the catchment of a number of lakes, Whitewood Lough being the closest at 0.6 km from Tower 241. The River Boyne and River Blackwater cSAC, will be oversailed by the alignment. Tributaries of the Boyne/Blackwater are used as spawning grounds for Atlantic Salmon and Trout.

Based on the available information, the majority of the Boyne and Tolka catchments are ‘at Risk of not achieving Good Status in relation to Surface Water (1a status). A review of monitoring station results suggests that, in general, the majority of the rivers along the alignment are slightly to moderately polluted.

Whilst historical flooding has occurred in both the MSA and CMSA, none of the proposed towers are located in any major flood plain. Some tower bases in the CMSA may be subject to pluvial flooding during wet weather.

For both study areas, impacts arise as a consequence of the construction phase. Whilst key water receptors will largely be avoided by the proposed development and no instream works are proposed, the potential exists for sediment and other pollutants to enter surface water. Measures to mitigate potential adverse effects are set out in Section 8.6 of the EIS. The mitigation measures seek to avoid or minimize potential effects through the implementation of best practice construction methods. The mitigation measures are set out in an outline Construction Environmental Management Plan (CEMP), all of which will be incorporated in the final CEMP.

Subject to the implementation of these mitigation measures a negligible impact on the aquatic environment for the construction phase is predicted. With regard to the

operational stage there will be no direct discharges to the water environment and negligible impacts are also predicted.

The hydrogeological environment is described in Chapter 7 including the underlying geology, groundwater bodies, groundwater flow, water usage, groundwater vulnerability etc. It is acknowledged the construction stage has the potential to impact on groundwater flow and quality, but these impacts would be of a temporary nature. Where excavations for tower bases encounter groundwater, inflows may need to be pumped, resulting in short term localised drawdown of the water table and discharges to surface water. The pumped water may contain suspended solids and contaminants, which in the absence of treatment may impact on water quality.

Mitigation to control discharge of suspended solids will include settlement using a filtration system with no direct discharge to streams or rivers. Impacts will be negligible and short terms. No significant impacts are predicted during the operational stage subject to implementation of the mitigation measures. Residual impacts are assessed as negligible. The majority of the tower locations are remote from dwellings and as a result it is considered unlikely that short term dewatering will impact on existing wells and boreholes.

5.12.2. Policy Context

Each of the individual county development plans acknowledge the importance of water as a natural resource from an ecological perspective, as a source of drinking water and as an important element for amenity and recreation. The policies and objectives focus on the protection and improvement of this resource. The plans also seek to minimise the risk of flooding by aiming to ensure that no new developments cause, exacerbate or are susceptible to flooding.

5.12.2.1. Monaghan County Development Plan 2013-2019

Objectives and policies for the protection of water are contained in Section 4.9 of the Plan. Flooding is considered in Section 6.4

- *Objectives for Protection of Water* - (WPO 1- WPO 5).
- *Policies for Protection of Water* - (WPP 1 - WPP 7, WPP 11 and WPP12)
- *Objectives for Flooding* - (FLO 1, FLO 4 and FLO 6).
- *Policies for Flooding* - (FLP 1 & FLP 3).

5.12.2.2. Cavan County Development Plan 2014-2020

Objectives and policies for the protection of water are contained in Section 8.12 of the Plan.

- *Water Protection Policies* – (NHEP26- NHEP29).
- *Objectives for Water Protection* - (NHEO50- NHEO-52).

5.12.2.3. Meath County Development Plan 2013-2019

Water quality is discussed in Section 7.14. Flood Risk Management is discussed in Section 7.15. Relevant objectives/policies include;

- *Water protection* - (Policies WS POL 19, WS POL 25, WS POL 26).
- *Flood Risk Assessment* - (Policies WS POL 29, WS POL 30 & WS POL 32 and Objective WS OBJ 15).

5.12.3. Issues raised by observers during the course of the application and during the oral hearing

The main issues raised in the submissions regarding impacts on water may be summarised as follows:

- The EIS fails to assess the potential impact on the water environment at a local level.
- Potential for release of contaminants into watercourses during the construction phase.
- Risk of concrete spillages due to the proximity of the towers to sensitive rivers and lakes.

- Sub-soil storage and water protection.
- Impacts on groundwater/risk to water supplies.
- Impacts on flooding.
- Environmental damage due to the use of zinc galvanised steel in the construction of the pylons.

The applicant's response to the issues is contained in Chapter 14 of EirGrid's submission of October 19th, 2015.

5.12.4. Oral Hearing

Water was discussed in Module 1.15 (Soils, Geology, Hydrogeology & Water) on April 5th, 2016 (Day 15) of the hearing.

Submissions were made by the following Observers in Part I of the hearing: -

- Mr. T Gourley, Senior Executive Planner (Monaghan Co Council).
- Mr. J P Mc Entee, Executive Chemist (Monaghan County Council).
- Dr. C Andrew (Geologist).

During the consideration of Module 2.4 (Specific Landowner and Public Issues) various site specific matters were raised, including issues regarding impacts on private wells/springs, pump houses and water pipes close to construction works.

In attendance for EirGrid were: -

- Mr John Dillon, Senior Environmental Engineer (TOBIN Engineers).
- Mr Robert Arthur, Senior Consultant (ESBI).
- Mr Jarlath Fitzsimons (Senior Counsel).

5.12.5. Assessment

5.12.5.1. The EIS fails to assess the potential impact on the water environment at local level.

It is argued in the submissions that due to difficulties encountered with regard to access to land, there is no robust evaluation of the impacts of the development on sensitive receptors such as watercourses, lakes, wetlands aquifers, private wells etc. In his submission to the oral hearing Dr C Andrew (observer) to the oral hearing asserted that the EIS is therefore totally inadequate, poorly scoped and fails to address the fundamentals of the receiving environment. Both Monaghan Co. Council and Dr Andrews criticise the lack of site specific information for each tower site and the reliance on a 'one size fits all' assessment.

In their submissions to the oral hearing Mr Toirleach Gourley and Mr PJ Mc Entee (Monaghan Co. Council) stated that the planning application was inadequate and failed to comply with the minimum requirements set out in the Monaghan County Development Plan (Policy WPP 5 and Appendix 13), which requires detailed water protection plans /site drainage plans for development applications.

The EIS provides a comprehensive description of the hydrological and hydrogeological character of the study area. The regional setting of the proposed development in relation to the surface water environment is described and is shown in Figures 8.1 – 8.4 Volume 3C & 3D. This is supported by information on water quality, details of protected areas, fisheries etc., and an evaluation of the importance of surface water features.

The hydrogeological setting is described in Chapter 7 of the EIS. Details of bedrock aquifers (Figures 7.9 - 7.12 Volume 3C & 3D) and the vulnerability of the aquifers traversed by the development are provided (Figures 7.13 - 7.16 Volume 3C & 3D). Wells in the area were identified using the GSI Well Card Index.

In terms of the receiving environment the Scoping Opinion issued by the Board stated that the *'information contained in the EIS should be based on comprehensive surveys of the area providing a thorough baseline assessment of the existing environment. The extent of baseline surveys undertaken should be identified including the methodologies and practices applied'.*

The limited access to land is acknowledged as a difficulty encountered in the preparation of the EIS (Section 1.5, Volume 3B). Access to land was only granted to c. 25% of the total landholdings along the alignment. In addition, visual surveys were conducted on another c. 38%. Information was also gathered from published sources national data sets and through consultation with prescribed bodies such as IFI, EPA and local authorities. This information was supported by high resolution aerial photography and LiDAR survey (in respect of 50m corridor either side of the alignment). The question that arises is whether there is sufficient information contained in the EIS to allow the Board to fully assess and make an informed decision on the application.

The Board will note that reference has been made in a previous section of this report (Construction) to the EPA's *'Guidelines on the Information to be contained in Environmental Impact Statements' (EPA, 2002).* It refers to the necessity to provide sufficient information to enable the identification and evaluation of the likely significant effects on the environment. In terms of 'sufficiency', the guidance states that enough information must be provided upon which to base a decision. It does, however, also acknowledge that the level of detail required will vary considerably according to the sensitivity of the existing environment and the potential of the project for significant effects.

It has not been demonstrated that the receiving environment is highly sensitive. With the exception of the River Boyne and Blackwater cSAC which will be oversailed by the development, the proposed development is well removed from other protected sites. I note from the EIS that most of the rivers with the exception of the River Glyde/Dee in the CMSA and the Kilmainham River in the MSA are suffering from water quality problems. Some of the lakes including Lough Egish

and Lough Mucknoo were also found to be highly polluted and of poor ecological status in monitoring carried out by the EPA in 2011/2012.

There will be no direct emissions to water from the proposed development during the construction or operational stages, which would give rise to pollution or the potential for significant adverse effects on the water environment. No instream works are proposed and the riparian zone will be avoided. Separation distances between works areas and water bodies are maximised and a suite of mitigation measures are proposed to reduce potential impacts during the construction stage.

I accept that it would have been beneficial if walkover surveys were carried out to verify the data provided from desk top studies and to obtain more localised information. However, having regard to the limited footprint of the individual towers, the limited size of the foundations and relatively minor excavations required, the separation distances to sensitive receptors, the localised and diffuse nature of potential impacts and the proposal to minimise potential effects through the implementation of best practice methods, I am satisfied no significant adverse will arise which would impact on the water environment or prevent water bodies from meeting objectives under the Water Framework Directive. I consider that the level of information provided is adequate to enable the Board to make an informed decision on the application.

With regard to the matters raised regarding the lack of specific site information for each tower site, I note that the type of information contained in the EIS is comparable to that submitted in respect of similar type transmission projects. As noted previously in this report (Construction), a similar approach was adopted in the SONI application relating to that part of the development located within Northern Ireland. Ground investigations were not carried out at the tower locations. It was confirmed by Mr Dillon (EirGrid) during the oral hearing that it is normal practice that intrusive site investigations would only take place after planning permission is granted and pre-construction. In this regard, I draw the attention of the Board to VA0004 (Connemara 110kV Reinforcement Project), VA

0013 (Mullingar to Kinnegad 110 kV Project) and VA0015 (Laois Kilkenny Reinforcement Project), where a similar approach was adopted.

Regarding alleged non-compliance with Policy WPP 5 of the Monaghan Co Development Plan, I note that it requires the submission of a water protection plan and detailed site drainage plans with all planning applications. Appendix 13 specifies the detail that should be submitted to include details of water supply, relevant water body, groundwater vulnerability, aquifer importance, details of waste water production and treatment (including construction phase waste water), fuel or outdoor materials storage, hard surface and open yard areas and drainage arrangements.

Policy WPP 5 targets developments on confined sites such as housing, industrial, agricultural, quarries etc. and makes no reference to linear development. I consider that the EIS includes all of the information specified and whilst detailed plans are not provided for each tower site (which appears to be consistent with normal practice for similar applications), I consider that the proposed mitigation measures as detailed in the EIS including the OCEMP comprehensively address water management and protection during construction.

Issues were also raised during the oral hearing regarding the adequacy of the swale proposed in association with the drainage proposals for the temporary construction materials storage yard. Planning Drawing MT-009-002 Volume 1B provides details of the site specific drainage proposals. The run-off arising will pass through a silt trap, oil interceptor and settlement lagoon before being discharged to surface water. It was confirmed by Mr Arthur that the swale was designed to suit the size and function of the site. Subject to run-off rates being limited to greenfield run-off rates as proposed, I do not consider that the potential for any significant issues arise.

5.12.5.2. Potential for release of contaminants into watercourses during the construction phase

It is accepted in the EIS that there are a wide range of activities that will occur during construction with the potential to increase the rate of run-off and the discharge of sediment and other contaminants to water courses. These include tree felling, placing of aluminum road panels /rubber matting for temporary access tracks, construction of tower foundations and towers, works near watercourses, stockpiling material, stringing of conductors and activities associated with the operation of the construction materials storage yard etc.

Inland Fisheries Ireland (IFI) have raised issues regarding the protection afforded to smaller streams, noting that the emphasis in the outline CEMP appears to focus on watercourses within the catchments of European sites. It notes that there are numerous watercourses in the vicinity of the works that have the potential to convey deleterious matter works unless proper safeguards are in place.

To reduce the potential for adverse impacts on water bodies, mitigation will first be achieved by avoidance. No in stream works are proposed along the proposed alignment and where possible temporary access routes, tower locations and stringing areas have been located away from watercourses.

Construction will be undertaken in a manner that will allow impacts to be managed to prevent impacts on the water environment. This will be achieved through a series of mitigation measures that are detailed in the outline Construction and Environmental Management Plan (CEMP), which is contained in Appendix 7.1 Volume 3B. It sets out a wide range of measures to cover each stage of the construction process and includes standard practices to contain and control the discharge of sediment and other pollutants from various construction activities. These are well established and recognised measures to protect water quality and include the use of silt barriers/curtains where works occur near watercourses, appropriate storage of soil/subsoil, secondary containment around fuel storage tanks, use of bunded areas for storage of materials/fuels, designated re-fueling/maintenance areas, use of brash mats in forested areas etc. It is confirmed

in EirGrid's response to the submissions and to the oral hearing that the mitigation measures will apply to all watercourses regardless of their designation.

I draw the attention of the Board to Submission No 66, submitted by EirGrid during the oral hearing, in response to questions on how discharges from the works area will be managed on a difficult site with a steep slope towards a watercourse.

The outline CEMP makes provision for water quality monitoring to be undertaken prior to construction, to confirm baseline data and ensure that there is no deterioration in water quality (Section 6.12). It was confirmed by Mr Dillon (EirGrid) during the oral hearing that water quality monitoring will be targeted on watercourses considered to be at a higher risk of pollution i.e. those located within 20m of the works. Daily inspections will be carried out and regular sampling for pH and conductivity. Sampling for suspended solids and hydrocarbons will be carried out should any change in the appearance of the watercourse be observed. It is proposed to continuously engage with IFI during the construction stage to ensure compliance with their requirements.

All elements of the outline CEMP will be included in the final CEMP. It sets the minimum standards that must be achieved to ensure the protection of the receiving environment. Any additional measures that may be incorporated in the final CEMP as a result of conditions will provide at least the same or a better standard of protection. In accordance with standard practice, it is intended that the final CEMP will be subject to ongoing review throughout the construction phase, through regular environmental auditing and site inspection, to confirm the efficacy and implementation of all relevant mitigation measures and commitments identified in the application documents. Its implementation will be monitored by the Ecological Clerk of Works (who will be a qualified Ecologist).

Issues were raised in the submissions regarding the potential for the release of 'toxic water' from former mine sites should they be encountered during construction. It was noted that there had been a number of recent mine collapses on lands close to the alignment and concerns were raised regarding the accuracy of information provided on the extent of the underground workings. Concerns were

also raised regarding a spoil heap associated with the former Tassan lead mine located on the western shore of Tassan Lough. It was confirmed by Mr. Dillon (EirGrid) at the oral hearing that (a) whilst the overhead line passes close to former mine sites, it does not pass through them and (b) the material adjacent to Tassan Lough would not be disturbed during construction. Further consideration of mine sites in the vicinity of the alignment (Towers 103-118) and the potential for impacts arising from the proposed development is provided in the Soils, Geology and Hydrogeology section of this report.

In conclusion, I accept that the potential exists for the contamination of the water environment from construction activity associated with the proposed development. This is fully acknowledged in the EIS. I accept that this can be effectively managed, mitigated and monitored through best practice procedures as set out in the outline CEMP and through continued engagement with Inland Fisheries Ireland.

5.12.5.3. Risk of concrete spillages due to proximity of towers to sensitive streams and lakes

Issues have been raised in the submissions regarding the potential for contamination from concrete spillages due to the proximity of the towers to sensitive watercourses including the Clady River (12m), Bective River (17m), Moynalty River (20m), Altmush stream (30m) and River Boyne SAC (6m).

Concrete is required for the tower foundations and will be transported using concrete trucks, which will be brought as close as possible to the excavation. It is clear from the information presented during the oral hearing that many of the access tracks will be inadequate to support large trucks and in such cases smaller dumper trucks fitted with concrete chutes will be used. In these situations, the concrete trucks will be parked up in a suitable location (pull in area, cross roads etc. along the public road) and concrete will be transferred to the smaller vehicles. Issues were raised by the observers regarding the potential for concrete spillages during transport along narrow laneways to the tower sites.

It was confirmed by EirGrid that the vehicles will be fitted with shuttering and covered where necessary to avoid spillage. It is clear that these procedures will require careful management to ensure that transporting vehicles are not overloaded and that the anti-spillage measures are adequate. I consider, should the Board be minded to grant approval for the development, that specific measures regarding the transfer and the management of concrete transport should be included in the CEMP. I note that concrete pouring will only take place in designated areas and in locations adjacent to watercourses will be postponed during heavy rainfall events. Once poured the concrete will be allowed to cure for a minimum of 48 hours. These measures limit the potential for spillages and discharges with impacts on the receiving environment.

I accept that the location of work areas close to watercourses increases the risk of pollution. Should a spillage arise there is potential for run-off of concrete into drains and watercourses close to the works areas that are potentially linked to more ecologically important streams. The discharge of concrete to a watercourse would alter its pH and impact on water quality. It is toxic to plants and fish and has the potential to destroy spawning grounds. To reduce the potential for accidental spillages, best practice measures as described above, will be incorporated into the construction methodology.

It is stated in the OCEMP that wash down and washout of concrete transporting vehicles will take place off-site, typically at a quarry site. However, during the oral hearing Mr R Arthur (EirGrid) stated that dumper trucks may have to be washed out locally, with discharge to a container for disposal off site. This poses additional risks to the water environment which would require careful management and monitoring to minimise such impacts.

5.12.5.4. Subsoil storage and water protection

Concerns have been raised regarding storage of soil following excavation to prevent impacts on water quality. I note that standard protocols will be implemented to minimise the potential for erosion of stockpiled material. Weather conditions will be taken into account when planning construction activities, to

minimise the risk of extreme run-off from works areas. Excavated material will be graded and stored separately adjacent to the excavation area and on dry areas away from watercourses/drainage ditches. Mineral soil will be stockpiled up to a height of 2m and peat where it is encountered up to a height of 1m. Stockpile surfaces will be shaped and profiled (graded to a <1:4 profile) to prevent erosion run-off and erosion protection mats will also be applied, if required. Additional measures will be employed to ensure peat is suitably stored i.e. geotechnical supervision in combination with monitoring.

The excavated material will be reused in-situ where possible and otherwise will be disposed of to a licensed facility. During the excavation and removal of soil for construction works, silt curtains will be installed upslope and downslope of the excavation to prevent migration of sediment and protect water quality.

I would point out to the Board that significant volumes of material will not be stored due to the limited footprint of the development at each tower site. In addition, the storage period will be short i.e. typically 3-6 days. This, coupled with the measures to be adopted, will ensure the effective management of soil/sub soil and limit the potential for adverse effects on the receiving environment.

5.12.5.5. Impacts on ground water, wells, springs and water supply

Impacts on groundwater and wells that provide a domestic/farm supply is a concern for some landowners. It is contended that the EIS does not consider the location of wells relative to pylons or the long-term construction impacts on the springs that support them. The HSE consider that all wells in the vicinity of the proposed line should be identified prior to construction. Issues were raised by Mr Nigel Hillis (CMAPC) during the oral hearing regarding the lack of hydrogeological assessment having regard to the proximity of wells to the works. Irish Water notes the potential of the development to traverse and impact on its assets. The Health Service Executive notes that the well data may not be specific to tower locations. Reference was also made by Dr Andrew to other sources of information on wells, which were not used by the applicant.

As stated in Chapter 7 of the EIS (Soils, Geology and Hydrogeology) there are a number of private wells used by individual landowners along the alignment. Due to the constraints regarding access, it was not possible to survey individual landholdings. Information was extracted from the GSI Well Database. The locations of wells are identified in Appendix 7.1 Volume 3C & 3D.

The only significant works that will occur below ground level will be associated with the construction of the foundations for the tower legs. Each of the corners of the tower structures will be separately anchored in a block of concrete. The tower foundations will typically range from 2m to 3.5m in depth to the invert level of the foundation and from 2m x 2m to 9m x 9m depending on the tower type. It is acknowledged in the EIS that the potential exists for groundwater to be encountered during excavations, particularly in low-lying areas.

Where groundwater is encountered inflows may need to be pumped resulting in short term localised drawdown of the water table. Given the limited extent of the excavations below ground level and the time frames for foundation construction, pumping is likely to be for short periods only, with limited impacts on groundwater. The extracted water may contain suspended solid concentrations and settlement may be required using standard water filtration systems to control the amount of sediment in surface water run-off. There will be no direct discharge of pumped water to streams or rivers.

Whilst the majority of wells are located close to properties, which are themselves removed from the alignment, wells/pump houses on specific landholdings were identified where potential damage could arise due to the proximity of works. The wells/pump houses typically occur close to proposed access roads rather than at tower locations.

It was confirmed by Mr Dillon (EirGrid) during the oral hearing that due to the refusal of landowners to engage it is possible that some wells could occur close to the works, which had not been identified. He acknowledged that the well on Traynors land (Lemgare) for example was within 17m of the works. In the case of Hugh and Damien Woods, an alternative access route was identified during the

course of the hearing (April 26th, 2016) to avoid a pumphouse located close to the original track to access Tower 126. Regarding observers concerns on potential damage to wells and water pipes during construction, EirGrid have committed that water supplies will not be interfered with and in the unlikely event that impacts do arise, a replacement supply would be provided.

Mr Stephen MC Cormack (Mc Cormack Farms, Boycestown) voiced his concerns regarding the potential impact of Tower 379, which he said is to be constructed on an area of ground that supports a spring water supply. It supplies water to the family farm/business and 5 no. family dwellings. The farm produces baby leaves, herbs etc. and supplies retailers and service companies in Ireland. It uses significant quantities of water, potentially up to 100,000 gallons a day during warm conditions. I accept that any interference with this water supply would be a significant concern. In response to questions from the Inspector, Mr Mc Cormack confirmed that there was a group water scheme in the area but that it did not have spare capacity.

Mr Dillon confirmed that EirGrid did have access to these lands in 2011 and that he did not envisage that there would be any impacts on the spring water supply. He said that water levels would be monitored throughout and post construction and that if impacts did arise an alternative source (public supply or a new well supply) would be provided. Mr Dillon stated that the construction methodology has been designed to avoid impacts. Where it is necessary to dewater to construct tower foundations, monitoring will be carried out on all wells within 100m of tower locations. This would involve monitoring of water levels and water quality before, during and after construction. The HSE have requested that specific details of the proposed monitoring be included in the CEMP.

Due to the limited footprint of the overall development, the limited depth of the tower foundations and the limited duration of the construction activity associated with the individual towers, I consider that there is relatively little potential for significant drawdown with impacts on wells. I accept that subject to effective monitoring and the provision of a replacement supply where necessary, it is

unlikely that any significant impacts will arise that would compromise the water supply available to landowners. I consider that the issues raised by Irish Water regarding protection of assets and consultation regarding works programme can be satisfactorily addressed by condition should the Board be minded to grant approval for the development.

Mr Jessop also referred to hydrology and water management on the Brittas estate. He noted that much of the estate's water supply came from spring sources using a hydraulic ram to pump water around the estate. He mentioned undisturbed historic water courses and a spring fed water course under the proposed alignment which had every chance of being contaminated. This, he said, could have unintended consequences for the water supply and biodiversity within the estate. No specific details of the location of the water system within the estate were provided to the hearing.

The majority of the alignment within the Brittas estate will be located on farmland, with the exception of wooded areas towards the front of the estate. Tree feeling/lopping will be required in this area. It is my understanding that this area would have been subject to intrusive ground works to facilitate more recent plantations of broadleaf woodland. It is not proposed to remove the base of the trees or the roots (outside the tower locations) which will minimise the potential for disturbance of any underground watercourses or pipelines that may exist in the vicinity. I accept that the applicant has a duty of care in respect to private property and EirGrid has committed to make good any unforeseen damage that may occur.

5.12.5.6. Impacts on flooding

Meath Co Council in its submission to the Board highlighted the potential flooding of tower bases. It is confirmed in applicant's response to the submissions and at the oral hearing that the 7 no. towers (Towers 284, 287, 288, 309, 310, 314, and 315) will be located in the Preliminary Flood Risk Assessment - Flood Zone A or B[77]. These are areas where there is a high /moderate probability of flooding and where development should generally be avoided.

[77] The Planning System and Flood Risk Management - Guidelines for Planning Authorities (2009)

The foundations will be located below ground level and there will be no increase in green field run-off rates as a result of the development. Floodplain flows will run freely between the open steel frame of the towers and given that limited footprint of, and the distance between towers (c. 350m), I accept the conclusion reached in the EIS that the proposed development will not exacerbate or contribute to flooding. Whilst essential infrastructure such as utility distribution is regarded as development that is highly vulnerable to flooding, the at risk components of the development are located well above ground. Having regard to the strategic infrastructural nature of the project, I consider that the proposal to locate the 7 no. towers as proposed is acceptable.

It was confirmed by Mr. Dillon following questions from the Inspector that there would be no particular construction related difficulties associated with these flood risk areas. Construction would take place during dry periods or periods of low flow, typically between July-October. No significant difficulties are anticipated given the short construction period associated with the towers.

I would point out to the Board that during the consideration of Module 1.14 (Flora & Fauna) issues were raised regarding the location of Tower 268/269 within the Brittas estate, which was asserted would be located within a floodplain. It was confirmed by Mr. D Mc Donald on behalf of EirGrid that aerial imagery taken during the summer months indicated no standing water. He indicated through Google imagery that there was a suite of dates and times in the year where the lands were not flooded. Mr. Dillon (EirGrid) confirmed that the area was subject to pluvial flooding, which would not have a detrimental effect on the operation of the proposed development. Construction would take place during the dry summer period.

5.12.5.7. Use of galvanised steel in towers increases the potential for environmental damage to watercourses.

Issues were raised in the submissions regarding the potential for a build-up of zinc at the bases of the towers. The towers are a lattice galvanised steel construction and will be assembled on site. No processes are involved other than lifting steel components into place to form the tower. The towers are galvanised to form a barrier effect and prevent corrosion of the steel. Over time there is the potential for oxidation of zinc through corrosion.

It was confirmed by Mr Dillon that what typically occurs is that there would be a build-up of zinc tolerant species below the base of the towers. This does not pose any risk to human or animal health due to the very high allowable concentration (i.e. >100,00 mg/kg). I note that the corrosion rate is slow and if zinc enters the water environment, it ends up deposited in sediments and is not bio-available. I would also note that galvanised steel has a very wide application and is used in farm structures, gates etc. and I am not aware that any significant concerns have arisen regarding negative impacts on water or the environment generally.

5.12.5.8. Other Matters

Issues were raised by Monaghan County Council regarding impacts on various wetlands, fens and bogs and these are considered under the Flora & Fauna section of this report.

5.12.6. Conclusion

Key issues arising from this section of the report relate to the impact of the development on the water environment.

It is accepted that the main potential impacts on the water environment will occur during the construction stage. There is no potential for direct impacts due to the routing of the alignment away from water bodies, with no direct emissions to water

It is accepted that the potential exists for indirect effects associated with the potential release of contaminants to the water environment. Having regard to the

limited footprint of the individual towers, the limited size of the foundations and relatively minor excavations required, the localised and diffuse nature of the impacts, the separation distances to sensitive receptors and the proposal to minimise potential effects through the implementation of best practice methods, I am satisfied no significant adverse effects will arise which would impact on the water environment.

It is accepted that while a small proportion of the towers will be located within a floodplain, the proposed development will not impede water flow and will not contribute to, or, exacerbate flooding.

It is accepted that the construction of the foundations, where ground water is encountered may result in localised drawdown which may impact on wells. Having regard to the limited size of the excavations, the limited duration of the works and the mitigation measures proposed, no significant impacts on water supplies are predicted.

Notwithstanding the lack of access to all individual landholdings, I consider that the information contained in the EIS is sufficient and adequate to enable the Board to make an informed decision on this aspect of the application.

5.13. Air and Climate

5.13.1. Environmental Impact Statement

Impacts on air, noise and vibration and air quality and climate, are dealt with in Chapters 9 and 10, respectively, of Volumes 3C and 3D of the EIS.

Chapter 9, in respect of noise and vibration, describes the existing environment of the study area, predicted noise levels and impacts arising for both construction and operation of the development.

Background noise levels, measured in 2013, are set out in Tables 9.2 to 9.3 (Vol. 3C and 3D). They are characteristic of a rural environmental influenced, in some instances, by transportation noise on the local roads. For the MSA background noise levels are provided for Woodland Sub-station and for the existing 400kV OHL. Nearest noise sensitive locations (houses, schools, hospitals etc.) are at least 50m from proposed tower locations.

Noise arising from the development during construction is estimated based on all proposed construction equipment operating on a continuous basis for one hour, with no allowance for screening of hedgerows, trees or buildings (Table 9.4 and 9.6, Vol. 3C and 3D respectively). The predicted noise of 71dB $L_{Aeq\ 1hour}$ at 50m, is just above the permissible levels at façade of dwellings provided by the NRA guideline document[78] i.e. 70dB $L_{Aeq\ 1\ hour}$ (Table 9.5 and 9.7, Vol. 3C and 3D respectively). However, given that the assessment is based on the worst case scenario, actual noise impact on receptors is predicted to be less.

Rock breaking, if required, will be carried out to adhere to NRA guidelines referred to in Table 9.5 and 9.7 (Vol. 3C and 3D respectively), for example, with use of temporary noise barriers if necessary. Construction traffic noise and supply vehicle movements are not predicted to cause any significant noise impact (see Section 9.5.2.1 and 9.5.2.2, of Vol. 3C and 3D). Similarly, noise levels arising from the construction and operation of the material storage yard are not considered to be significant at nearby sensitive receptors (Tables 9.6, 9.7 and 9.8,

[78] *Guidelines for the Treatment of Noise and Vibration in National Road Schemes 2004*

Vol. 3C). Vibration arising from the construction phase of the works (excavation and piling, if it is required) will be kept within internationally recognised standards (Table 9.9, Vol. 3C and Table 9.8, Vol. 3D).

Operational impacts include those arising from maintenance of vegetation (tree lopping), annual inspection by helicopter and noise arising from the overhead line itself (corona discharge, continuous operational noise, Aeolian noise and gap sparking). Noise arising from maintenance of the OHL is not considered to be significant due to the localised, short term and temporary nature of impacts

The EIS states that corona noise:

- Will vary with environmental conditions (being greater in conditions of fog or light rain),
- Under certain circumstances can exceed background levels by +10dB (see Figure 9.2 and Section 9.5.3.1, Vol. 3C and 3D).
- For all weather conditions corona noise is predicted to be less than the standard guideline of 52dB(A)L_{50} at 50m from the OHL (paragraph 98, Section 9.5.3.1, Vol. 3C and 3D).
- Will be below the standard guidelines of 52dB(A) L_{50} at the nearest property to the double circuit line (27m) at the southern end of the proposed development (paragraph 87, Section 9.5.3.1, Vol. 3D).

Predicted continuous operational noise, Aeolian noise and gap sparking are not considered to be significant (Section 9.5.3.2 to 9.5.3.4, Vol. 3C and 3D), due to the low level of noise predicted relative to background levels or frequency of the noise emitted.

Chapter 9 is supported by the following drawings:

- Noise Monitoring Locations (Figures 9.1 to 9.4, Vol. 3C and 3D).

Chapter 10, in respect of air quality and climate describes the challenges facing the country in terms of climate change, ambient air quality and other emissions to

air within the study area. It identifies potential impacts arising from the proposed development and considers that, with mitigation, the proposed development will:

- Contribute positively to long term residual impacts on greenhouse gas emissions as it will facilitate further development and connection of renewable energy sources reducing dependency on fossil fuels,
- Will not give rise to significant dust emissions, or
- Adversely impact on air quality.

5.13.2. Policy Context

Policies of the Monaghan County Development Plan 2013 to 2019, Cavan County Development Plan 2014-2020 and Meath County Development Plan 2013-2019, generally support the government's objectives in respect of climate change and seek to:

- Maintain air quality for existing and proposed developments (Policies AQP 1, NHEP 32 and PC Pol 1 respectively).
- Control adverse environmental noise arising from proposed developments (Policies NCP 1, NHEP 34 and PC Pol 1 respectively).

5.13.3. Issues raised by observers during the course of the application and during the oral hearing

Issues raised in respect of the application for approval and during the oral hearing can be summarised under the following headings:

- Adequacy of the assessment (baseline monitoring).
- Noise and vibration arising from construction activities.
- Noise arising from operation of OHL (particularly on sensitive receptors).
- Cumulative impacts with noise and vibration from Tara Mines and M3.
- Other matters.

Concerns regarding the impact of construction noise on health and animal welfare are dealt with in the Health and Land Use sections of this report respectively.

The applicant's response to the issues raised is contained in Chapter 15 of EirGrid's submission to the Board dated 19th October 2015.

5.13.4. The Oral Hearing

Impacts on Air were principally addressed in Module 1.17 on the 30th March 2016 (Day 12) of the oral hearing. Issues were also raised during the Part 2 of the hearing in particular in Modules 2.3 & 2.4 (Specific Landowner and Public Issues).

Submissions were made by the following observer in Part 1 of the hearing:

- Dermot McCague, EHO Monaghan County Council.

In attendance for EirGrid were:

- Brian Murray, Senior Counsel.
- Jarlath Fitzsimons, Senior Counsel.
- Dr. Paddy Kavanagh, Environmental Director, ESBI.
- Barry Sheridan, Acoustic Consultant, AECON.
- Robert Arthur, Senior Consultant (Construction), ESBI.

5.13.5. Assessment

5.13.5.1. Baseline Monitoring

The observers draw the Board's attention to the baseline data on which the noise impact assessment is based. They consider that it is not representative of noise in the area as it provides higher background noise levels than generally exist, for example, influenced by the noise from lawnmowers etc.

I note that the applicant carried out manual noise surveys at public roads along the length of the proposed development at 41 locations, with intervals of approximately c.2.5km intervals. Monitoring was carried out at different times of the day and night, for intervals of 10-15 minutes. Consistent with industry standards, the noise survey work was carried out in dry weather, in the absence of wind (such that background levels are not over estimated). Furthermore, survey results are similar to those surveyed in 2009.

Having regard to the survey methodology outlined and to my observations that the survey data appears to reflect the noise environment of the study area i.e. a generally quiet rural environment, which is typically influenced by noise from road traffic, I would conclude that the baseline survey data adequately reflects the noise environment of the proposed development and is robust for the purpose of impact assessment. I do not consider that it was necessary to extend the noise monitoring exercise to a continuous 24-hour period.

5.13.5.2. Noise and Vibration Arising from Construction Activities

Observer's draw the Board's attention to their concerns regarding noise arising during construction, in particular from:

- Construction sites and construction traffic.
- Noise and vibration from rock breaking.
- The vibration impacts of heavy vehicles on the structure of property in close proximity to access routes.
- The cumulative impact of construction occurring at several sites.
- The absence of assessment of noise arising from tree felling/clearance.

Impacts arising from dust, on livestock, are dealt with in the Land Use section of this report.

Construction Noise

The EIS predicts that noise arising from the construction and operation of the materials storage yard (during construction of the project), at tower locations and during the extension of the Woodland sub-station, will not exceed industry standards for construction projects i.e. the widely adopted standards set out in the NRA's *Guidelines for the Treatment of Noise and Vibration in National Road Schemes 2004.* The approach adopted in the assessment, whereby all construction equipment is assumed to be in operation at one time (i.e. across all phases of the development), would appear robust. In situations where rock is encountered, I note that the applicant will construct noise barriers to ensure that the same NRA standards are not breached.

For construction traffic on access routes, I note that at the proposed speed of 30mph the average predicted noise level for HGVs occurring over 1 hour varies between 52.8 and 54.0 dB $L_{Aeq, 1hr}$ (Section 9.5.2.1). Whilst I accept that this may be in excess of background levels in quiet rural environments, and cause nuisance when vehicles travel in close proximity to residential property, these areas would typically have agricultural equipment travelling on local roads which are likely to generate similar noise levels. Furthermore, construction activity at any one tower site is relatively modest and occurs for a relatively short period.

Having regard to these factors, I do not consider that the construction of the proposed development would generate significant noise at nearby sensitive receptors.

Vibration

A number of observers draw the Board's attention to the risk of damage to buildings with HGVs passing in close proximity to them[79]. In response, the applicant proposes adherence to NRA allowable vibration standards at sensitive locations to prevent damage to buildings[80] (Table 9.9, Volume 3C). Furthermore, during the oral hearing, Mr Arthur (EirGrid) stated that pre and post construction monitoring could be carried out of any buildings which parties had concerns about.

With the adherence to NRA standards, and having regard to the slow speeds proposed for heavy construction vehicles (see above) I would not anticipate any structural damage to properties arising as a consequence of ground vibration. However, I consider that the applicant's proposal for pre and post construction survey is appropriate for landowners who have particular concerns regarding

[79] For example, in respect of property in proximity to access route to towers 164, 180, 182, 190 and 260.

[80] During the oral hearing the applicant clarified that mitigation measures to ensure adherence to standards would involve use of dampers on hammers and excavators, or use of alternative equipment/construction methodology e.g. mechanical excavation with breaking offsite.

buildings in close proximity to access routes. This matter could be dealt with by condition should the Board be minded to grant permission for the development.

Cumulative Effects

The applicant's construction methodology, as set out in the EIS and as clarified during the oral hearing (and discussed in the Construction section of this report), indicates that construction will be undertaken on a phased basis and with no two towers constructed simultaneously if accessed by a minor road network. In addition, towers are c.350m apart. I would not expect therefore that significant cumulative noise or vibration impacts would arise as a consequence of the development.

Tree Felling

With regard to tree felling, I note that clear felling of commercial woodland will take place at a small number of discrete sites along the length of the route. Elsewhere, tree felling and vegetation removal is very modest and site specific. Given the reasonably short duration of these activities and the relatively low level of noise associated with them (typically a chainsaw), I do not consider that significant noise impacts will arise. Similarly, construction traffic associated with the movement of timber would be of short duration, would be likely to be by agricultural scale machinery and unlikely to give rise to significant noise impacts.

5.13.5.3. Noise arising from the Operational Phase of the Project

The observers draw the Board's attention to operational noise arising from the overhead line. They argue that noise from a 400kV OHL is clearly audible over long distances (up to 200m), is exacerbated by weather conditions (humming and crackling noises) and will impact on the quietness, peace and tranquillity of the countryside. They argue that due to the elevated nature of the noise source mitigation is not possible.

High voltage overhead lines give rise to four types of noise, gap sparking, Aeolian noise, corona discharge and continuous operational.

Gap sparking

Gap sparking (noise which occurs at electrical gaps between mechanically connected metal parts) occurs at high frequencies and is not audible to human ears. It would therefore not give rise to any noise impacts for people living or working in the area. (In the course of the oral hearing the applicant stated that this extremely high electrical frequency noise was not anticipated to have any impact on animals).

Aeolian noise

Aeolian noise (turbulent wind noise) can be created by high wind speeds, e.g. blowing through the steel lattice towers. However, as stated by the applicant, this is not normally an issue as ambient noise, due to the wind itself, masks any Aeolian noise arising. The applicant also states in response to the observations made that there has been no significant history of complaint in Ireland with regard to Aeolian noise despite thousands of metres of high voltage lines.

Corona discharge

Corona discharge is the humming/buzzing and crackling noise associated with overhead lines, particularly in damp or wet weather. It was observed during site inspection of the existing 400kV lines extending from Woodland sub-station. Figures 9.2 and 9.3 (Vol. 3C and 3D) illustrate corona noise arising from a single circuit and double circuit 400kV OHL in wet conditions. It is evident from this that:

- At source (i.e. under the OHL), for 50% of the measured time average noise levels of 50dBA for both single and double circuits are predicted to occur and for 10% of the measured time, average noise levels of c.60dB (A) are predicted.

- At 100m, noise levels fall to an average of 43-44dB (A) for 50% of the measured time, and, to an average of c.50dB (A) for 10% of the measured time.

In a rural area where background noise levels are typically low (see Table 9.2 and 9.3, Vol. 3C and 3D) corona noise would therefore be audible at distances up to 100m from the proposed overhead line. (The L_{10} predicted noise levels in Figures 9.2 and 9.3 can be compared with the L_{10} baseline noise levels in Tables 9.2 and 9.3, Vol. 3C and 3D). I would accept the observers view, therefore, that the proposed development would detract from the quiet amenity of the countryside, when in close proximity to it (c.100m) and on wet/damp days. To mitigate this impact, the applicant has proposed the fitting of air flow spoilers on conductors and the fitting of composite insulators.

To predict the likely impact of the proposed development on sensitive receptors, for example residential properties, the EIS refers to a New York Public Service Commission (NYPSC) guideline rain level limit for corona noise of 52dB (A) $L_{50.}$ This is based on an indoor maximum noise limit of 35dB (A) and noise attenuation of 17dB (A) for a partly closed window. (During the oral hearing (Day 33), Mr Sheridan for EirGrid also referred to WHO Night Time Noise Guidelines for Europe (2009), which refers to an in indoor standard of 30dB and a conversion factor of 21dB between outdoor and indoor noise).

Predicted corona noise at 50m from the proposed development (Table 9.10, Vol. 3C and 3D), for both the double and single circuit line, is a maximum of 48dB(A) L_{50}. It is assumed, therefore, that the proposed development will not cause noise annoyance for nearby residents (within properties). Over the length of the proposed development, only two properties fall within 50m of the centre line of the proposed development. Having regard to this level of separation and the predicted corona noise levels, it is my view that corona noise is unlikely to adversely impact on the internal environment of a property, for example, disturbing sleep patterns. I also note that, in damp or wet weather windows are more likely to be closed.

The two properties lying within 50m of the proposed development, are properties at the southern end of the development where the proposed OHL travels with the existing Oldstreet to Woodland 400kV OHL. The closest residential receptor to the double circuit is c.27m from the centre line. Predicted corona noise at this property is stated to be 51dB (A) L_{50}, which would be c.1-2dB (A) higher than that arising from the existing single circuit line (Figure 9.2, Vol. 3D) but lower than the NYPSC guideline limit. Having regard to the relatively modest increase in predicted noise level and the predicted internal noise levels for the operation of the line, which are within the NYPSC standard (and WHO standard), I do not consider that the proposed development will result in an unacceptable or significant increase in corona noise, for the section of the line that runs in tandem with the exiting 400kV line.

With regard to cumulative corona noise, arising from a number of high voltage overhead lines, this aspect of the development is not assessed in the EIS and may occur at a small number of locations where the proposed development traverses other 220kV or 110kV OHLs. At worst case, corona noise will increase slightly in the immediate vicinity of the two lines. Given the general absence of properties within 50m of the proposed development (and the decline of corona noise with distance) I would not expect significant adverse impacts to arise from cumulative corona noise.

Continuous operational noise.

Continuous operational noise arises from the operation of high voltage overhead lines. However, unlike corona noise, whilst audible it is not dominant over background noise levels and contains no tonal component. Table 9.4 and 9.5 of the EIS (Vol. 3C and 3D) present the results of background noise monitoring at Woodland sub-station and directly under the existing 400kV line at Bogganstown. They indicate background noise levels of 38.3 dB (A) $_{LA90}$ for the existing Woodland substation and an average background noise level of 39.6 dB (A) $_{LA90}$

for under the overhead line. (Inspection of Woodland sub-station site confirmed the low level of operational noise associated with the sub-station).

Typical background noise levels in the study area are shown in Tables 9.2 and 9.3 (Vol. 3C and 3D) and these include existing noise sources in the study area. Predicted operational noise levels compare well to typical background noise levels. Consequently, it is my view that significant impacts are unlikely to arise from the proposed development as a result of continuous operational noise.

5.13.5.4. Cumulative Impacts

Having regard to the short duration of construction works, the isolated and relatively modest nature of construction sites and proposals to mitigate impact, significant cumulative impacts are unlikely to arise from the proposed development in conjunction with noise and vibration arising in the wider environment e.g. from Tara Mines and the MS.

Similarly, as significant operational noise is likely to arise only from corona noise, in some weather conditions and in close proximity to the OHL, I do not consider that significant cumulative impacts will arise during the operation of the proposed development.

5.13.5.5. Other Matters

Both Monaghan County Council and Meath County Council propose conditions to ensure that adverse noise and vibration impacts are minimised during construction of the proposed development. However, if the applicant puts in place the work practices and mitigation measures set out in the application for approval (Table 11.1, Vol. 3B), I do not consider that significant adverse noise and vibration impacts would arise. Additional conditions, requiring agreement of work practices with planning authorities to minimise such impacts would seem therefore unnecessary.

The HSE recommend that a formal complaints procedure is put in place to resolve any issues or community concerns (for example, in relation to noise, dust, traffic). It is my view that subject to the full implementation of mitigation measures set out

in the outline Construction Environmental Management Plan and outline Traffic Management Plan (and any conditions imposed by the Board), no significant environmental impacts should arise during the construction of the proposed development. However, I consider that this would be appropriate as it would provide a mechanism for the public to resolve any issues of concern, in the event that they do arise.

5.13.6. Summary and Conclusion

Key issues arising in respect of noise and vibration include nuisance arising from noise and vibration during construction and from operational noise, in particular, corona noise.

Having regard to the methodology used to assess background noise levels, it is considered that the assessment carried out in respect of noise and vibration, is sufficient to identify the likely significant environmental effects of the development.

Having regard to:

- The temporary nature of construction work,
- The linear nature of the project,
- The phased approach towards construction,
- The predicted noise levels which fall within widely used industry standards for construction projects, and
- The proposed mitigation measures,

It is considered that the proposed development will give rise to temporary noise and vibrational impacts, in close proximity to construction sites and access routes. However, these impacts will be managed and maintained within acceptable levels for the duration of the construction and will not give rise to significant impacts on amenity.

Having regard to the small number of properties in close proximity to the proposed development, the level of corona noise which is predicted to occur and adherence

to international standards for corona noise, it is considered that the development will not give rise to significant noise nuisance on sensitive receptors as a consequence of corona noise. However, it is accepted that corona noise is likely to cause localised noise nuisance in quiet rural environments, under certain weather conditions. To mitigate this impact, the applicant has proposed the fitting of air flow /spoilers on conductors and the fitting of composite insulators.

5.14. Landscape and Visual Impact

5.14.1. Environmental Impact Statement

Impacts on landscape and visual amenity are primarily dealt within in Chapter 11 of the EIS in Volumes 3C and 3D. This includes Appendix 11.2 (Vol. 3C and 3D) which evaluates the visual impact of the proposed development on residential property (*North-South 400kV Interconnection Residential Visual Impact Assessment)*.

The EIS emphasises that the alignment of the proposed development has been carefully considered to avoid and minimise visual and landscape effects. It accepts that is not always possible.

5.14.1.1. Landscape and Visual Effects

The EIS describes the characteristics of the proposed development and the existing landscape context. It identifies and assesses potential landscape and visual effects for the construction and operational phases of the development. For both study areas construction impacts are considered to comprise generally temporary, locally significant visual and landscape effects due to the removal of vegetation, visible construction machinery, use of access routes, materials storage yard, guarding positions and increased vehicular movements.

For the operational phase of the development, the EIS concludes that whilst the agricultural landscape of the three counties is generally robust, the proposed development will result in residual unavoidable adverse effects on landscape character and unscreened views within 600m to 800m of the alignment. Some areas that are particularly elevated in relation to the line will experience significant effects up to 1km. The landscape effects of the development will be particularly noticeable where the line crosses roads, or where hedgerows are low and /or panoramic views are available.

Specific sensitive locations along the route which will experience significant residual impacts include:

- For the CMSA, a plateau and valley close to the jurisdictional border with Northern Ireland (including a section of the Monaghan Way), the setting of the Fair of Muff, a scenic view east of Shantonagh, the vicinity of a number of small lakes, and most commonly where towers need to cross drumlins in order to avoid other constraints.
- For the MSA, the Boyne River Valley at Bective, the Blackwater River Valley at Teltown and Brittas Estate.

Residual landscape and visual impacts are summarised in Table 11.18 and 11.22 of Appendix 11.1 of Vol. 3C and 3D respectively. I note that the tables are not consistent with the summary of impacts set out in Chapter 11 of Volumes 3C and 3D. In particular, Table 11.22 (Vol. 3D) also states that significant residual impacts will occur at:

- Dunderry and Robinstown (outskirts of village).
- The Boyne Valley Driving Route (localised impact).
- A proposed walking route along the river Blackwater (localised impact).

Appendix 5.1, Vol. 3B assesses the potential for partial undergrounding of the proposed development to address landscape and visual effects. The report concludes that there is no environmental justification for partial undergrounding and, that if the option were to proceed, it would add significant cost to the project (in the order of €94 million to €174 million).

5.14.1.2. Residential Visual Impact Assessment (RVIA)

The visual impact of the proposed development on residential property is evaluated in Appendix 11.2 of Vol. 3C and 3D *North-South 400kV Interconnection Residential Visual Impact Assessment*. The assessment identifies 1,070 properties (mostly residential properties) within 500m of the line route (including15 properties in Northern Ireland). The report concludes that of these, 55% (593) will experience significant residual impacts as a consequence of the development as follows:

- 2.8% (30 No.) of properties will experience a major adverse impact, where the development would cause a very noticeable deterioration in the existing view, typically occurring where the development obstructs an existing view

of the local landscape and the development would dominate the future view.

- 9.7% (104 No.) of properties will experience a moderate to major adverse impact.
- 42.9% (459 No.) of properties will experience a moderate adverse impact, where a development would cause a noticeable deterioration in an existing view.

For the remaining 45% (477 No.), these properties will experience a negligible or minor-moderate adverse visual impact during the operational phase of the project.

The following drawings support Chapter 11 of the EIS:

- Landscape Character Areas (Figure 11.1, Vol. 3C and 3D).
- Landscape Character Types (Figure 11.2, Vol. 3C and 3D).
- Photomontage Locations (Figures 11.3 to 11.6, Vol. 3C and 11.3 to 11.7, Vol. 3D).
- ZTV (Figures 11.7 to 11.10, Vol. 3C and 11.8 to 11.12, Vol. 3D).
- Photomontages (Nos. 1 to 77, Vol. 3C and 3D).

5.14.2. Policy Context

5.14.2.1. European Landscape Convention

The aims of the European Landscape Convention (Council of Europe, 2000) are to promote landscape protection, management and planning and to organise European co-operation on landscape issues. The Convention requires parties to the document to, amongst other things:

- Recognise landscapes in law,
- Analyse and assess landscapes within the territory, and
- To determine and implement policies in respect of identified landscapes with a view to protecting, managing and/or planning the landscape.

5.14.2.2. National Landscape Strategy

The National Landscape Strategy (DAHG, 2015) comes forward within the context of the European Landscape Convention and aims to provide a high level policy framework to achieve a balance between protection, management and planning of the national landscape. Stated actions include the development of a national landscape character assessment, development of landscape policies in respect of the management of this resource and increasing public awareness.

5.14.2.3. County Development Plans

Monaghan County Development Plan

The Monaghan County Development Plan, 2013-2019, recognises the unique character of the Monaghan landscape in its:

> '*intimate quality with drumlins, interspersed with lakes, trees and woodlands. This landscape of small enclosed fields with foreshortened horizons is different and indeed unique from that of the more open landscape found in many other parts of Ireland'.*

Policies and objectives of the plan seek to:

- Protect landscape character and quality, having regard to the County Monaghan Landscape Character Assessment (Policies LPO1, LPP1 to LPP3).
- Afford protection to scenic routes, lakes and their environs (Policies AVP1 and AVP 2).
- Afford protection to trees and hedgerows within the County (THP1 and THP3).
- Afford protection to historic demesnes with designed landscapes (ABO44).

Chapter 7 of the County Development Plan refers to National Trails within the County, including the Monaghan Way (a 56.5km walking/hiking route) and policy objective CWO5 affords protection to them.

County Monaghan Landscape Character Assessment

The proposed development passes through four of the Landscape Character Areas, identified in the County Monaghan Landscape Character Assessment, described briefly below (Figure 11.1, Vol. 3C):

- Mullyash Uplands (Tower 103 to Tower 128) - This area is described as one of steep sided drumlins, with a strong north west to south east alignment, which rise to a plateau as one moves north, and small field patterns. The upland flat areas (together with the summit of Mullyash Mountain) are stated to be '*highly sensitive to development owing to both their scenic quality and visual exposure'.*
- Monaghan Drumlin Uplands (Tower 128 to Tower 136) – This upland landscape is described as comprising less steep upland drumlins, drumlin foothills, small to medium sized loughs and occasional rock outcrops near Annyalla. Land uses are mostly pastoral farming with native hedgerow species defining field boundaries. The LCA states that whilst recognising that the highest points are likely to be highly sensitive to development, in general the landscape would not be regarded as highly scenic and therefore has capacity to accommodate development without undue compromise to the farmed landscape pattern.
- Ballybay Castleblayney Lakelands (Tower 137 to Tower 142) – This area is described as a low lying Lakeland landscape which extends across the width of the County between two upland ridgelines. Key characteristics include low lying pastoral landscape with frequent widely spaced drumlins and numerous loughs. The area is considered to be highly scenic, with the farmland in good condition and the variable drumlin topography and inter drumlin hollows a key contributing factor to character and scenic quality. The lough and lough shore environment are considered to be highly sensitive to any form of development.
- Drumlin Upland Farmland of South Monaghan (Tower 143 to Tower 211) – Again this area is described as an uplands landscape that is characterised by drumlin hills given over to pastoral uses, with a strong field pattern defined by hedgerow boundaries and frequent large sized loughs.

Landscape at lower elevations is regarded as moderately sensitive to development and lakes, lake environs and higher rocky remote landscapes, as highly sensitive to any changes involving large developments or tall structures.

The Landscape Character Assessment refers to proposed upgrades of the national transmission network and states that this has the potential to significantly affect the physical landscape of the County.

Cavan County Development Plan

The Cavan County Development Plan 2014 to 2020 recognises the range of landscape types within the county and the unique sensitivity of these to development. The proposed development (Towers 212 to Tower 239) passes through one of the identified Landscape Character Areas, the Highlands of East Cavan[81]. Policies and objectives of the plan afford protection to landscape character, quality and distinctiveness of the landscape character areas (NHEP19, NHEO22 and NEO25).

Policies and objectives of the Plan afford protection to the following landscape features:

- Area of High Landscape Value (NHEO26).
- Scenic views (NHE028).
- Woodlands, trees and hedgerows (NHEO17 and NHEO21).

Meath County Development Plan

The Meath County Development Plan 2014-2020 recognises and values the county's cultural and natural assets, including its built heritage, demesne landscapes, scenic rivers and rolling farmland. Policies and objectives of the Plan:

- Seek to protect the County's landscape character as defined by the Landscape Character Assessment (LC SP1, LC OBJ 2 and 3).

[8181] Not described further in the Plan.

- Recognise and afford protection to the county's historic designed landscapes (CH POL 19, CH OBJ 22 and 23).
- Afford protection to the County's green infrastructure, trees and hedgerows (GI POL 2, NH POL13 and NH POL 15).
- Protect identified views and prospects from inappropriate development (LC OBJ 5).

The Plan refers to the planning authority's intentions to establish a Landscape Conservation Area for the Tara/Skryne Landscape. Prior to the establishment of this, the landscape is afforded protection under policy LC POL 3.

Energy and communications policies require that proposed local energy services be placed underground where appropriate and promote the undergrounding of existing overhead cables and associated equipment where appropriate (EC POL 16 and EC POL 19).

Meath Landscape Character Assessment

The proposed development passes through seven Landscape Character Areas described in Appendix 7 of the County Development Plan (Figure 11.1, Vol. 3D, Figures):

- North Meath Lakelands (Towers 240 to Tower 273) – This area is described as a complex drumlin landscape, wetter and more wooded than the rest of Meath and having significantly less built development. Small lakes and streams occur between drumlins and road corridors are often raised above adjacent fields. Landscape character around settlements tends to be a well-managed patchwork of small pastoral fields, dense hedgerows and small areas of broadleaved woodland. The central area between Nobber and Kilmainhamwood is considered to be particularly attractive due to its more visible historic references (e.g. stonewalls and vernacular buildings).
- North Navan Lowlands (Towers 273 to Tower 302) – This Landscape Character Area is described as a large area of agricultural land to the north of Navan contained to the east and west by the Rivers Blackwater and

Boyne respectively and to the north by the more complex hilly landscape of the North Meath Lakelands. The landscape character area is described as degraded comprising a mix of pasture and arable fields that have been enlarged by the removal of traditional boundaries. The Landscape Character Area includes more flat and remote parts of Meath.

- Blackwater Valley (Tower 303 to Tower 312) – This Landscape Character Areas is designated around the Blackwater River Valley. The River flows through County Meath along a pastoral landscape that changes from being relatively flat around Navan to the low undulating drumlins beyond Kells. The Landscape Character Area is described as an attractive one, rich in visible historic features including demesne landscapes, castles, churches, earthworks and vernacular features such as stone bridges. The open farmland is characterised by a loss of internal field boundaries. Hedgerows that remain comprise of clipped thorn, ash and gorse on earth banks.
- West Navan Lowlands (Tower 313 – Tower 351) - This Landscape Character Area is described as a flat lowland farmland landscape interspersed with many large estate landscapes with associated parkland.
- Boyne Valley (Tower 352 – Tower 363) – This Landscape Character Area, associated with the valley of the River Boyne, is stated to be arguably the most significant in the county as it contains the Bru na Boinne World Heritage Site and the heritage towns of Trim and Slane. In the area of the proposed development the landscape is characterised by areas of rolling lowland and pasture farmland adjacent to the River Boyne.
- Central Lowlands (Tower 364 – Tower 395) – This area is described as a large lowland landscape composed of rolling drumlins interspersed with numerous large estates and associated parkland. Thick wooded hedgerows separate medium to large fields and deep roadside drainage ditches and banked hedgerows are a common feature of the landscape.
- Tara Skryne Hills (Tower 396 – Towers 401 and existing Towers 402 - 410) – The Landscape Character Assessment describes the Hill of Tara as an area of raised upland to the south of Navan comprising broad rolling hills separated by a mixture of well managed small and large fields enclosed by thick hedgerows. The upland aspect of Hill of Tara provides panoramic

views over the landscape. Lowland areas within the LCA are well wooded and enclosed. The Area is described as having high scenic value and of national/international importance.

The Landscape Character Assessment refers to electricity infrastructure and states that the impact of these generally large and prominent features will be determined by their visual prominence and their location in sensitive landscapes.

5.14.3. Issues raised by observers during the course of the application and during the oral hearing

A large number of submissions were made by observers in respect of potential landscape and visual impacts. They can be grouped under the following headings:

- Adequacy of assessment.
- Impacts on residential properties.
- Impact on landscape character and visual effects.
- Impact on landscape features.
- Impacts on demesne landscapes.
- Impact on settlements.
- Impact of construction phase on countryside
- Visual impact of vegetation removal.
- External appearance of materials storage yard.
- Visual impact of flight diverters.
- Cumulative effects.
- Options for partial undergrounding
- Conflict with policy.

The applicant's response to the issues raised is contained in Chapter 16 of EirGrid's response to the Board of the 19th October 2015.

5.14.4. The Oral Hearing

Landscape and Visual Impacts were principally addressed in Module 1.9 on the 23rd March 2016 (Day 9) of the oral hearing. Issues were also raised during Part 2 particularly in Modules 2.3 & 2.4 (Specific Landowner and Public Issues) by many individuals, in particular with concerns regarding the visual impact of the proposed development on their property.

Submissions were made by the following observers:

- Toirleach Gourley, Senior Executive Planner, Monaghan County Council.
- Michael Griffin, Senior Executive Officer, Meath County Council.
- Jill Chadwick, Heritage Officer, Meath County Council.
- Conor Skehan (CAAS) for Meath County Council.
- Mary Marron (CMAPC).
- Margaret Marron (CMAPC).
- Dr. Padraig O'Reilly (NEPPC).
- Aimee Tracey (NEPPC).
- Public representatives (including Cllr. Sean Gilliland).
- Michael O'Donnell (Senior Counsel) for Brittas Estate.

In attendance for EirGrid were:

- Brian Murray, Senior Counsel.
- Jarlath Fitzsimons, Senior Counsel.
- Joerg Schulze, Senior Landscape Architect, AECON.
- Kevin Coffey, Line Routing Specialist, ESBI.
- Robert Arthur, Senior Consultant (Construction), ESBI.
- Alistair Henderson, Digital Visualiser, AECON.
- Declan Moore, Principal Archaeologist, Moore Group.
- Des Cox, Senior Planning Consultant, EirGrid.

5.14.5. Assessment

5.14.5.1. Adequacy of Assessment

Photomontages

A number of observers, including NEPPC, CMAPC, public representatives and individual landowners, considered the photomontages provided by the applicant to be unsatisfactory or misleading. For example:

- Playing down the legibility of towers[82] or the visual impact of the proposed development,
- Including objects, topography or vegetation in the foreground to screen the development,
- Excluding nearby housing (see submission No. 27 to oral hearing by Cllr Sean Gilliland),
- Excluding the effects of permanent localised trimming or removal of taller vegetation.
- Taken from significant distances and failing, therefore, to show a realistic view of the development.

Observers suggest that model pylons should be constructed in key areas along the route or LiDAR used to provide further information on the likely visual impacts of the proposed development.

In response to the observations made, Mr. Schulze for the applicant, argued that:

- The photomontage locations were discussed and agreed with the relevant planning authority,
- The photomontages have been produced to current best practice guidelines[83], which includes carrying out the landscape and visual impact assessment from the public road or areas accessible to the public, and

[82] In particular, for photomontages 6, 10, 11, 18, 19, 20, 23, 24, 25 and 27.

[83] EPA (2003) Advice Notes on Current Practice in the Preparation of EIS, Landscape Institute (2011) Advice Note on Photography and Photomontage in Landscape and Visual Impact Assessment (2011), Landscape Institute (2013) Guidelines for Landscape and Visual Impact Assessment LI 2013.

- The photomontages provide an illustration of the likely effects and viewing experiences of the proposed development.

The applicant accepted that the photomontages did not, and could not, portray all aspects of the development at all locations. Mr Schulze also argued that it was not the intention of the photomontages to illustrate impacts on residential property, as this aspect of the development was assessed in the Residential Visual Impact Assessment (Appendix 11.2, Vol. 3C and 3D).

I have reviewed each of the photomontages referred to by the observers[84]. I have viewed these, and all of the photomontages, in the field. I have also observed the appearance of existing electricity infrastructure within the study area and I have noted the legibility of steel lattice towers against different backgrounds, for example, against the sky or against a landscape backdrop, and in different weather conditions. In this regard the Board may also wish to refer to the applicant's submission No. 13c to the oral hearing which illustrates the different legibility of existing 220kV steel lattice towers against different backgrounds.

Whilst I would accept that in some of the photomontages landscape features (including vegetation) do obscure views of some of the towers and overhead lines, these features are components of the existing environment and would, in practice, act in the same way. In a small number of photomontages, I would accept that some towers appear quite illegible for example, Tower 147 in Photomontage 18, Tower 129 in Photomontage 11, Tower 361 in Photomontage 64 and a number of Towers in Photomontage nos. 27 and 41. However, I am mindful of the difficulties of discerning towers (and therefore depicting same) in some weather conditions. I would also accept that in some instances, houses in close proximity to the camera have not been included in the particular view (e.g. Photomontage nos. and 73, 52), which can appear disingenuous, even if the applicant's objective with the photomontage has been to illustrate a different point. Finally, I would also accept that the photomontages have not depicted the impact of vegetation removal.

[84] Including photomontage nos. 3, 4, 5, 6, 9, 10, 11, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 31, 35, 41, 52, 53, 53A, 55, 59, 60, 63, 64, 65 and 73.

Mindful of these factors and having regard to:

- My inspection of the line of the proposed development, under different weather conditions, at different times of the year and at different distances from it,
- My personal use of the photomontages on site to compare existing and anticipated views, and
- My observations regarding the wider views available in the field (to exclude features in the fore ground and to include nearby residential development),

I consider that the photomontages depict the types of impacts which will occur, in different landscapes, at different distances from the proposed development and that they are generally satisfactory as an aid to understanding the visual effects of the development in the landscape. Whilst it may be useful, I do not consider it necessary therefore for the applicant to erect models along the route, or, to use additional tools, over and above those used (such as LiDAR) to further demonstrate the likely visual effects of the development.

Holford Rules and Landscape and Visual Impact Assessment

The observers argue that in failing to adopt and carry out its visual assessment by reference to the Holford Rules, the applicant has failed to comply with best practice guidelines in its assessment.

My understanding of the Holford Rules is that they were developed in the 1950's by Lord Holford as a series of planning guidelines in relation to amenity issues to guide the routing of overhead power lines. They include avoiding at the outset areas of high amenity, where possible taking a direct line and choosing tree and hill background in preference to sky backgrounds etc. I note that the selection of route corridors, a preferred corridor and detailed line design, has had regard to these principles, seeking to avoid existing areas of high amenity, taking a direct route etc. I do not accept, therefore, that the applicant has failed comply with best practice in this regard.

5.14.5.2. Impacts on Residential Properties

The observers draw the Board's attention to:

- The number of properties within close proximity to the proposed development, including those outside of the 500m assessed in the RVIA.
- The serious impact of the proposed development on the amenity and enjoyment of these residential properties.
- Differences in the minimum distance between the OHL and residential property in Northern Ireland compared to that in respect of the proposed development.
- The absence of assessment of impact on the curtilage of properties.
- The outdated map base used in the Residential Visual Impact Assessment (RVIA).

Number of Properties falling in Close Proximity to the Line

The applicant's RVIA identifies 1,070 properties falling within 500m of the proposed alignment. I would accept that, on the face of it, this would appear to be a large number of properties. However, I would draw the Board's attention to the following:

a. A key objective of the applicant's approach to route selection has been to avoid routing the proposed development close to residential areas. Consequently, of the 1,070 properties falling within 500m of the alignment, only 298 fall within 200m of it[85], over the full length of the proposed development (102.5km), as follows:
    - 0-50m – 2 No. residential dwellings (both located along the existing Oldstreet to Woodland 400kV line).
    - 50-100m – 69 No. residential dwellings.
    - 100m-150m – 103 No. residential dwellings.
    - 150-200m – 124 No. residential dwellings.
b. Having regard to the dispersed pattern of rural development throughout rural Ireland, it would be very difficult to achieve a route which is routed away from all residential property.

[85] Table 5.1 of Volume 2A (Planning Report)

I would consider, therefore, that the applicant has made a very reasonable effort to minimise the number of properties falling in close proximity to the proposed development.

Impact on Amenity and Enjoyment of Properties

Numerous observers draw the Board's attention to their concerns regarding the visual impact of the proposed development on residential property. Specific examples were discussed during the oral hearing and the Board may wish to refer to submissions made by some observers (e.g. by Jimmy Marron, Sean Lynch, Terry Lynch and Cllr. Sean Gilliland).

The applicant's RVIA is based on desk study and on site verification. I note that it includes vegetation clearance associated with the development, adopts a winter perspective and assumes a worst case scenario if access was not available. As stated above, of the 1,070 properties falling within 500m of the proposed development it considers that:

- Due to vegetation, topography and/or orientation of the property 477 (45%) of these properties will experience a negligible or minor-moderate adverse impact,
- For the remainder, 593 properties (55%), the proposed development would result in a significant impact, primarily due to impact on views from the property and the prominence of the development in these views.

From my inspection of the route corridor, I would accept that in in some cases vegetation, topography or orientation of property may negate the visual effects of the development (even if the property lies in close proximity to the proposed development). Equally, I would accept that for many properties impacts will be significant and this would include many of the specific examples referred to during the oral hearing[86,87.] I would consider, therefore, that the findings of the RVIA are

[86] For example, Martin Traynor, CMSA B07 (moderate to major impact); properties near tower 109 (major impact); CMSA R50 (moderate-major impact), CMSA R52 (moderate impact); Collette McElroy, CMSA B66 (moderate to major impact); CMSA B92 (moderate impact); Paul and Eugene Russell, CMSA B117 (major adverse impact); Francis Clarke, CMSA B119 and R148 (both

essentially robust and identify the extensive local impact of the proposed development on residential property in close vicinity to the proposed development.

I would consider therefore, that if approved, the proposed development would result in a significant impact on the amenity and enjoyment of c.600 properties falling within 500m of the development, with consequential long term, adverse effects for the individuals and families affected. It is possible that in some instances additional vegetation and screen planting could mitigate these impacts. The Board may wish to address this matter by condition.

Visual Effects on Properties outside of 500m

The observers draw the Board's attention to the large number of properties > 500m from the proposed development, which may also be adversely affected by it.

The applicant's landscape and visual impact assessment concludes that over the full length of the development, the residual and unavoidable impacts will include the adverse effects on landscape character and on unscreened views within 600-800m of the alignment and, in some areas that are particularly flat or elevated in relation to the line, significant effects at distances up to 1km (Section 11.9 of Vol. 3C and 3D).

This conclusion would suggest that visual effects will occur as a consequence of the development beyond 500m. Whilst I would accept this conclusion from a landscape character perspective, I would consider that at distances of more than 500m, towers and conductors are unlikely to dominate views or to seriously detract from the amenity or enjoyment of a property.
I am therefore minded to accept the overall conclusions in respect of the landscape and visual impact assessment i.e. that the most significant visual

moderate to major impact); CMSA R187 (moderate-major impact); CMSA B142 (major impact), CMAS AR102 and R199 (moderate impact).

[87] Also included above is CMSA RP1. However, I note that Figure 5 indicates incorrectly shows the predicted impact of the development on this property which is stated to be Major in Appendix 1 of the RVIA.

impact will occur within 500m of it and that these impacts on property have been adequately assessed in the RVIA.

Distance from Properties

During the oral hearing the applicant clarified that for both jurisdictions a policy of maximising the lateral distance between the proposed development and residential development had been adopted. This had resulted in the line being 54m from the nearest property in Northern Ireland. In this State the nearest properties are existing properties located along the existing Oldstreet to Woodland 400kV line, which lie within 50m of the proposed development (the nearest property is 41.7m from the central conductor – Figure 34, Vol. 3B). All other properties are >50m from the centre line of the proposed development. It would appear, on the basis of the applicant's submissions, that the approach adopted is therefore consistent across both jurisdictions.

Curtilage

I note that the applicant has measured the distance of the OHL to the nearest façade of a building. Whilst I recognise that this approach:

a. Reflects the methodology adopted for the assessment of a number of environmental effects, e.g. noise, dust, and
b. Represents a practical and consistent approach to measuring distance,

I do accept the third party's arguments that this approach does not reflect the proximity of the line to areas associated with the enjoyment of a house, typically a garden.

Notwithstanding this, I suspect that if such a methodology was adopted, the overall conclusions of the RVIA would not change i.e. that the proposed development will have a significant adverse effect on the amenity of a large number of properties within 500m of the route alignment.

Map Base

The observers draw the Board's attention to the maps accompanying the RVIA (Figures 1 to 35, Appendix 11.2, Vol. 3C and 3D) which are based on OSi aerial photography captured in 2005. They therefore omit properties built since.

During the course of the hearing the applicant confirmed that the properties included in the RVIA have been derived from both Land Registry and Geo-directory data, with regular searches carried out (most recently as Q4 of 2014). I note that properties not evident in the 2005 aerial photography are included as a labelled icon in the map legend (e.g. CMSA R52 on Figure 35, RVIA). I am satisfied, therefore, that the residential and commercial properties constructed in the area, or granted planning permission, since 2005 have been properly included in the RVIA.

5.14.5.3. Impact on Landscape Character and Visual Effects

A large number of observers, including Monaghan County Council, Meath County Council, elected representatives, NEPPC and CMAPC, draw the Board's attention to the significant impact the development will have on the rural landscape through which it passes, including the drumlin landscape of County Monaghan and County Cavan and on the more open rolling countryside of County Meath.

The proposed development passes through an attractive rural landscape. To the north, in County Monaghan and County Cavan, the landscape is typified by the rolling drumlin landscape with its network of small fields and low lying lakelands. As one moves south to County Meath, the drumlin landscape of north Meath gives way to a flatter and lower lying pastoral landscape. Features include larger agricultural holdings, numerous demesnes with their designed landscapes, the Blackwater and Boyne River Valleys and the distinct presence of numerous historic buildings and monuments. Landscape character is reflected in the Monaghan Landscape Character Assessment, Cavan Landscape Categorisation and Meath Landscape Character Assessment as referred to in the respective County Development Plans (see above).

The proposed development comprises a significant component of our electricity transmission infrastructure. As designed, its physical components are substantial and individual towers are potentially highly visible with little option for mitigation. This inherent nature of the development is acknowledged by the applicant who, at route selection stage, identified a preferred route with a less elevated underlying topography in relation to the main viewing opportunities (Final Re-evaluation Report 2013, Section 7.3) and, in detailed design, sought to direct the route away from major settlements, designated landscape features and other environmental constraints.

The applicant's assessment of landscape impacts and visual effects acknowledges the likely negative effects of the proposed development. It concludes that, for each landscape character area, the development will result in a significant alteration of landscape character most notably at distances up to 600-800m from the alignment, with some significant effects at up to 1km in areas that are particularly flat or elevated in relation to the line.

Having regard to my inspection of the landscape through which the proposed development passes, of existing high voltage electricity infrastructure and the plans and particulars in respect of the development, I would concur with this overall conclusion. The substantial towers and elevated conductors at close quarters, will inevitably be highly visible and, with their 'industrial' character, detract from the typically rural landscape through which they pass. For some more sensitive landscapes, notably exposed drumlins, in proximity to lakes and crossing river valleys, landscape and visual effects will be more pronounced. However, it would also be my view that as one moves away from the line, in the drumlin landscape of Monaghan, Cavan and North Meath, views of the development could be quickly lost (as is the case with existing infrastructure). In the flatter landscape of county Meath, whilst potentially more visible, the pattern of rural development, strong roadside hedgerows and mature woodland, would often obscure views of the development.

In summary, I would accept therefore that the development is likely to have a significant impact on the landscape character of the area through which it passes but that these effects are likely to be most acute in immediate environs of the route, typically the 600-800m identified by the applicant. Outside of this distance, I accept that towers will be visible but not dominant and therefore only having a significant effect in particularly open or elevated landscapes. Impacts on specific landscape features e.g. drumlins, lakelands and river valleys are discussed further below.

Siting of Towers on Drumlins

Observers argue that the applicant has failed to justify the positioning of towers on elevated or exposed positions. In particular, Monaghan County Council raise concerns regarding the following Towers 107-109, 112, 114, 116-125, 127-131, 133, 134, 137, 139, 141, 144, 146, 150, 153-159, 164, 167, 171-176, 179, 182, 183, 186-191, 193, 194, 197-201, 206-208, 210 and 211.

The applicant's Response document acknowledges the location of towers on drumlins. It states that this arises as a consequence of technical, environmental and landowner considerations (Section 4.2.2.4 of Response document). However, in response to the observations made, the applicant provides an alternative line route for the proposed development through the drumlin landscape, with many towers moved to lower ground (see Figures 5.3 to 5.13, Response document).

As argued by Mr. Gourley, the level of detail provided on alternative line routes in the Response document is quite limited and options are consequently difficult to scrutinize. Notwithstanding this, each option was debated at the oral hearing and my understanding is that whilst it is technically possible to move the towers to mid contours the consequence of this would typically be:

- A requirement for additional line straights, towers or angle towers (enabling the line to turn around the drumlins),
- A greater number of road crossings, and

- Often moving the line towers closer to other environmental constraints.

Furthermore, as argued by Mr. Schulze, at a lower contour, the towers effectively move into the valley between drumlins, and with this, into the inhabited landscape. They are therefore more likely to be in closer proximity to, and view of, residential properties.

Whilst I accept, therefore, from a landscape perspective alone that it would be preferable to site the proposed development on the lower slopes of drumlins or within the valleys between drumlins, I am not persuaded of the merits of doing so, due to the consequences of this for other equally important environmental constraints.

5.14.5.4. Impact on Landscape Features

The observers draw the Board's attention to the impact of the development on:

- Areas of amenity,
- Protected views and scenic routes,
- Lakes, their environs and river valleys,
- Driving, walking, cycling routes and local roads,

Impact on Areas of Amenity

A large number of parties raise concerns regarding the impact of the development on areas of amenity. I have inspected each of the areas of amenity referred to and the views to be had from them, having regard to the plans and particulars in respect of the development.

- Mullyash Mountain - Mullyash Mountain is designated as an Area of Secondary Amenity Value in the Monaghan County Development Plan 2013 – 2019 (SA4). It lies c.6k to the east of the proposed line route (Figure 11.3 and Photomontage 6, Vol. 3C). At this distance, and in some weather conditions, the tops of some towers may be visible from the mountain. However, these will be seen at distance and generally against a landscape background (it will not break the skyline). I consider that the

development would not therefore dominate or detract from views to be had from the mountain and that any impact on it would be slight.

- Lough Major Area of Secondary Amenity Value - Lough Major lies to the south east of Ballybay, Co. Monaghan. The lough and its environs are designated as an Area of Secondary Amenity Value in the Monaghan County Development Plan 2013 – 2019 (SA12). It lies c. 2.3km to the west of proposed alignment (Figure 11.4 and photomontage 17, Vol. 3C). It is possible that under certain weather conditions, a small number of towers would be visible against the sky. Whilst these would detract from views from the lough, at 2.3km I do not consider that the development would dominate views or would detract significantly from the amenity of the Lough.
- Lough Muckno Area of Primary Amenity Value - Lough Muckno lies to the east of Castleblayney town. The Lough and its environs are designated as an Area of Primary Amenity Value in the Monaghan County Development Plan 2013 – 2019 (PA2). It lies c. 7km to the east of proposed alignment (Figure 11.4 and Photomontage 14, Vol. 3C) and is largely separated from the development by topography and Castleblayney town. Having regard to this, no significant impacts on the Area of Primary Amenity Value are likely.
- Lough an Lea Mountain - Lough an Lea Mountain lies c.2km to the west of the overhead line (Figure 11.6 and photomontage 41, Vol. 3C). It is identified in the Cavan County Development Plan as an Area of High Landscape Value and affords panoramic views of the landscape to the east of the mountain. A protected viewpoint looks due east (SV8), towards the alignment and a looped walking route is provided around the top of the Mountain (partly through woodland). A picnic area is provided at the scenic viewing point.

  Lough an Lea Mountain provides elevated views of the countryside to the east of the mountain. Towards the development the existing view comprises the expansive undulating topography, small field pattern, scattered rural development and distant backdrop. The proposed development would appear in the middle distance and would be seen against a landscape backdrop. Currently an existing 220kV OHL traverses

to the south of the mountain c.1.5km from the designated viewing point (see Figure 11.6, CMSA). From the top of the mountain, this existing line is difficult to discern against the landscape background. I would consider, therefore, that the proposed development, which is at a similar distance but at a different orientation, whilst visible from the scenic view and looped walk would not be overly dominant. (In coming to this view I have also had regard to the applicant's submission No. 13c, to the oral hearing, which illustrates the visibility of an existing HVOHL against different backgrounds). In summary, whilst the development may be visible from Lough an Lea under certain weather conditions, I do not consider that it would be dominant in views or therefore significantly detract from the amenity area.

- Kingscourt/Dun A Ri - Kingscourt/Dun a Ri is identified in the Cavan County Development Plan as an Area of Special Landscape Interest. It lies c.2.7km to the east of the proposed development but is separated from it by topography, the town of Kingscourt and substantial mature vegetation. Having regard to these factors, I do not consider that it would be adversely affected by the development in any way.

Impact on Protected Views and Prospects and Scenic Routes

Observers raise concerns regarding impact of the proposed development on a number of protected views and scenic routes in Co. Monaghan (SV12-14 and SV22-SV23), County Cavan (SV8) and Co. Meath (Nos. 17, 44, 86).

a. County Monaghan

Table 11.14, Appendix 11.1, Vol. 3C lists the Scenic Views in the County which are of relevance to the proposed development. The location of these, relative to the alignment, are shown in Figures 11.3 to 11.6, Vol. 3C. No significant impacts are predicted for any of the identified viewpoints.

SV12, SV13 and SV14 are views from Mullyash Mountain and from a designated scenic route around the summit. The mountain lies approximately 6km to the east of the proposed development. SV12 faces west, towards the development, SV13

east away from the development and SV14 south. Scenic views SV13 and 14 will not be affected by the development by virtue of their orientation and/or the distance of the route from the viewpoints. SV12 looks towards the route but, as discussed above, at this distance the proposed towers and lines will be largely undiscernible, seen largely against a landscape background. The development would not, therefore, dominate or detract from designated scenic views or from the scenic route around the mountain.

SV21 is a designated scenic view from the public road to the north east of Lough Egish looking south west over the Lough. The public road is also a designated scenic route (Figure 11.4, Vol. 3C). The proposed development skirts around the lough running north-west of it and then south west. It is separated from the viewpoint by an undulating topography. Views of the development from the scenic view and the scenic road are likely to be confined to the tops of towers (Photomontage 19). However, from the scenic view and scenic route any views of the towers will be seen within the context of the substantial industrial development associated with Lakeland Dairies, Lough Egish Food Park and other business located to the south west of the Lough (Figure 7, Vol. 3B). Within this context, I do not consider therefore that the development would have a significant impact on SV21 or the associated scenic route.

SV22 is a scenic view from a minor public road to the south of the R181 in the vicinity of Shantonagh House, looking both south west and south east. The public road twists and turns as it passes over the undulating topography. Views of the towers will be possible from some vantage points, for example, as suggested in Photomontages 26 and 27 (Vol. 3C) and, whilst not dominating, will detract from the rural and undeveloped nature of the route and the amenity of the scenic view.

SV23 lies c. 4km to the west of the proposed development and is orientated primarily south, towards Lough Bawn. At this distance and orientation from the proposed development, whilst potentially visible, will not substantially interfere with views from the scenic route or significantly detract from amenity of the scenic route.

Monaghan County Council argue that the applicant has not provided evidence of mitigation measures to reduce the impact of the development on scenic routes. I note the applicant's comments that the primary mitigation measure adopted for landscape impacts was avoidance at route selection stage, discussed previously in this report and generally accepted. Chapter 11 of Vol. 3B summarises mitigation measures, including those to protect vegetation and soils during construction and the re-establishment of hedgerows post construction. Micro mitigation is proposed for landscape and visual effects arising in the Blackwater Valley, Brittas Estate and Boyne Valley. Such measures are not proposed for impacts on scenic routes and having regard to my conclusions above, I do not consider that they would be warranted in County Monaghan (SV 12, 13,14, 21, 23) or practical (SV22) given the wide viewshed affected.

b. County Cavan

Submissions on the proposed development raised concerns regarding the impact of the development on SV8 in Co. Cavan. This is discussed above (Lough an Lea).

c. County Meath

Table 11.13, Vol. 3D, Appendix 11.1 lists the Protected Views and Prospects in the County which are of relevance to the proposed development. The location of these, relative to the line, are shown in Figures 11.3 to 11.7, Vol. 3D. Significant impacts are predicted for only one of these protected views, No. 86 (Table 1.22, Vol. 3D, Appendix 11.1).

During the course of the application Meath County Council submitted an assessment of the proposed development on protected views in the County (CAAS Ltd). It considered that the proposed development would have a moderate /high impact on two protected views, nos. 17 and 86, and a high/very high impact on one protected view, No. 44, from the Hill of Tara (MCC submission to the Board on the 21st August 2015).

Protected view No. 17 is located on a minor public road to the north east of Cruicetown. The orientation of the view is north and north east and it is described in the County Development Plan as '*Expansive views to distant locations to north and to views of Carlingford, Mourne Mountains to the north east. Highly varied topography. Woodlands in lowlands'*.

The proposed development is located c.800metres to the north east of the viewpoint (Figure 11.4, Vol. 3D). Towers 269 to 272 will fall within the scenic view (Photomontage 47). Two of the towers will be seen against the topography, which will reduce their visibility, but two will be seen against the sky. The development will, therefore, introduce quite prominent structures into the rural landscape, at relatively close view, and detract from expansive, distant views. I consider that the development would therefore detract from this protected view.

Protected view No. 44 is located on the Hill of Tara, a major tourist attraction and archaeological site in County Meath. The protected view, of national significance, is described in the County Development Plan as having panoramic and distant views over the settled landscape. The protected view falls within the Tara Skryne Landscape Character Area of Exceptional Landscape Value and within the draft Tara/Skryne Hills Landscape Conservation Area (Figure 11.6, Vol. 3D).

The Hill of Tara and the protected view in particular are located approximately 6.5km to the east of the proposed development (in the vicinity of Towers 350 to 370). As described in the County Development Plan, from the viewpoint extensive views across the landscape are possible to both the west, south west and south, where the proposed development is routed. From the viewpoint, the landscape is complex with a mix of man-made development (e.g. one off housing, roads and agricultural development) and strong natural features of hedgerows and mature trees. An existing power line (Gorman-Maynooth 220kV line) runs to c.1.25km to the west of the viewpoint. On inspection, it is evident that the steel lattice towers are difficult to discern within this landscape (Photomontages No. 68 and Appendix 16.2 of the Response document).

On behalf of Meath County Council, Conor Skehan (CAAS Ltd) argued that proposed development would give rise to a high/very high impact due (a) to the national significance of the protected view and (b) that the proposed development would occupy a significant portion of the field of view and would be noticeable to visitors under many types of light condition (e.g. in winter before noon on days with clear skies). In contrast, Joerg Schulze, for the applicant, whilst accepting that the view was of national importance, considered that the development would not be highly visible or prominent and therefore would not detract from it.

Similarly, I would acknowledge that the protected view from the Hill of Tara to be of national significance. However, given the difficulty in discerning the existing 220kV OHL at c.1.25km of the viewpoint, it is difficult to accept that the proposed development at 6km would be prominent or particularly noticeable to visitors, especially as it would be viewed against a landscape backdrop. In the absence of any substantial intrusion into this nationally important protected view, I consider that it is not sustainable to argue that the proposed development would significantly impact or detract from the scenic view.

The proposed development lies outside, and to the west of, the draft Tara/Skryne Landscape Conservation Area (Figure 11.6, Vol. 3D). Closest towers comprise those between Tower 351 and 359 and include those visible from Bective Abbey (see below). I would accept therefore that the proposed development would detract somewhat from views to be had from the draft Tara/Skryne Landscape Conservation Area. However, given the extensive area of the Landscape Conservation Area and the general distance of the proposed development from it, I consider that no direct impacts will arise and indirect impacts are unlikely to be significant.

Protected view No. 86 is taken from Bective Bridge and is orientated from south through north to east (Figure 11.6, Vol. 3D). It is described in the County Development Plan as the '*View looking northward from Bective Bridge towards Bective Abbey and along the River Boyne in both directions'.* Views from the Bridge towards the Abbey and along the River Boyne to the east will not be

affected by the development. To the west the bridge provides views of the river flanked by its pastoral landscape. The proposed development will introduce at least three towers into this landscape (Photomontage 66) and detract from the visual amenity of the view. This significant impact is accepted by the applicant.

Impacts on Lakes and Environs/River Valleys

Observers draw the Board's attention to the impact of the proposed development on lakes and their environs in County Monaghan and County Cavan, and on river valleys in County Meath.

a. County Monaghan/County Cavan

The observers, including Monaghan County Council, representatives of fishing clubs and gun clubs and a number of individuals, argue that the proposed development would adversely impact on a number of lakes and their environs. In particular, Monaghan County Council draw the Board's attention to the impact of the development on Lough Nahinch, Tassan Lough, Ghost Lough, Drumgristin Lough, Coogan's Lough, Tonyscallon Lough, Toome or Crinkill Lough, Boraghy Lake, Lough Egish, Lough Morne, Shantonagh Lough, Bocks Lough, Comertagh Lough and Beagh Lough. They also argue that consequent mitigation measures have not been included.

I have inspected the line of the proposed development and each of the loughs referred to in the EIS and by the observers. Having regard to (a) the distance between the lough and the proposed development and/or (b) screening provided by topography or vegetation, I would consider that the setting of a number of these loughs (and their environs) will not be adversely affected by the proposed development, specifically Lough Nahinch, Tonyscallon Lough, Toome/Crinkill Lough, Lough Egish, Shantonagh Lough, Comertagh Lough and Beagh Lough.

With regard to Tassan Lough, the proposed development lies c.300m to the north of this lough in a reasonably open landscape (Figure 2, Vol. 3B). Views of the lough from the public road to the south are limited due to the low lying nature of

the lough and substantial hedgerows alongside the public road. However, where visible from the public road, and from the lough itself, the proposed development would be prominent. I would accept therefore that the development would have a significant local residual impact on it.

With regard to Ghost Lough, Drumgristin Lough and Coogan's Lough, this cluster of lakes is situated in an area where there is an undulating topography and limited view of the lakes from the public road network (Figure 3, Vol. 3B). Similarly, Boraghy Lake (Figure 7, Vol. 3B) and Bocks Lough (Figure 8, Vol. 3B) are well screened from the public road network. However, I would accept that the setting of all of these loughs may be affected by the proximity of the proposed development.

From the public road the proposed development is also likely to be visible to the north of Muff Lough (Figure 14, Vol. 3B) against a rising topography/landscape and it is likely to detract somewhat from the setting of the lough. Of most significance is the impact of the development on Lough Morne where proposed towers 167 and 168 (and possibly 166) will be clearly visible from the lough side and possibly for a short distance from the public road passing to the north of the lough (Figure 7, Vol. 3B and photomontage 24). This impact is acknowledged by the applicant in Section 11.5.4.4 of the EIS, but not in Table 11.18.

In summary, I would conclude therefore that the proposed development is likely to detract from the setting of a small number of lakes in County Monaghan and County Cavan, most notably Lough Morne and, to a lesser extent, Tassan Lough due the clear visibility or proximity of pylons in views across these loughs. These impacts are generally acknowledged by the applicant in the EIS (Section 11.5.4.1 to 11.5.4.5 and 11.9, Vol. 3C) and Response document (Section 16.2.13).

With regard to mitigation, the EIS states that the primary mitigation measure has been avoidance of landscape impacts at route selection stage and this point is accepted. Reference is also made in the Response document (page 248) to micro landscape mitigation (retention or enhancement of trees and hedgerows in key

locations), protection of vegetation and soils during construction and re-establishment of hedgerows after construction. These are general measures and do not address the impact of the development on the setting of the above loughs. However, it is a matter that could be addressed by the Board by way of condition i.e. such that the Community Gain Fund would be available to address landscape and visual impacts arising as a consequence of the development (subject to the approval of the relevant planning authority and in agreement with landowners).

b. County Meath

The observers, including Meath County Council, raise concerns regarding the effect of the development on the river environment as it crosses the River Boyne and the River Blackwater.

The proposed development crosses the Blackwater River between Towers 310 and 311 (Figure 24, Vol. 3B). The river landscape comprises an open pastoral landscape, of large agricultural fields that fall gently towards the river, the meandering Blackwater and the attractive built environment of Donaghpatrick. Both towers are removed from the river's edge and are located in adjoining agricultural fields.

Photomontages 55, 58 and 59 indicate the likely visual effects of the development as it crosses the river, as viewed from the public roads in the vicinity of the site and the site of Teltown Church. Photomontages 53 and 53A show more distant views of the line as it crosses the river valley and Photomontages 56 and 57 illustrate the proposed line as it would be seen crossing the river valley from Donaghpatrick Bridge and Church.

The proposed development introduces substantial contemporary urban structures into traditional open rural riverside environment and would detract from its visual amenity. As is evident from the photomontages, visual impacts significantly reduce with distance from the proposed development. I would concur therefore with the conclusions of the EIS with regard to the significant, but localised, residual

visual effects of the development on the River Blackwater (and therefore on any proposed walking route along the River).

With regard to the River Boyne, the proposed development crosses this river between Towers 355 and 356 (Figure 29, Vol. 3B). This riverine environment is not as expansive as the River Blackwater, but is more enclosed, with a smaller and more linear field pattern alongside the river, mature riverside woodland/trees and the historic structures associated with Bective Abbey, Bective Mill and Bective Bridge. The proposed development will again introduce substantial urban structures into this historic and attractive landscape in close proximity to the river and would detract from its visual amenity (Photomontage 64, 65 and 66). In this instance, views of the riverine environment from the public road network are more limited (e.g. Photomontage 63, 67, 67A) and again impacts diminish with distance.

I would concur therefore with the conclusions of the EIS with regard to the significant, but localised, residual visual effects of the development on the River Boyne.

Impact on the Visual Amenity of Driving/Walking/Cycling Routes and Local Roads

A large number of submissions made in respect of the development raise concerns regarding the impact of the development on driving/walking/cycling routes and local roads, notably:

- The Monaghan Way (and Lemgare Rocks).
- The N2.
- Public roads in County Monaghan.
- Lough an Lea Walking Route.
- Informal cycling routes (Moyvalty to Kiltale area).
- The Boyne Valley Driving Route.
- A proposed walking route along the Blackwater River (considered above).

a. County Monaghan

The Monaghan Way is a long distance walking route (56km) that runs between Clontibret and Inniskeen in Co. Monaghan. The proposed development runs parallel to the walking route for a distance of c. 2km, between Towers 104 and 108, and then crosses over the walking route between Towers 108 and 109 in the townland of Lemgare (Figures 11.3, Vol. 3C).

The section of the proposed development in the vicinity of the walking route occurs in a remote rural drumlin landscape. The public road that runs parallel to the proposed development (and which the Monaghan Way follows) is at a lower elevation than the proposed development. However, views of it from the road would be screened by the undulating topography and vegetation to the north east of the public road. For most of this stretch of the public road views of the proposed development would therefore not be dominant. As one approaches Lisdrumgormly, the elevation of the overhead line rises to cross the higher topography in the vicinity of Lemgare Rocks and the development would be particularly visible from the public road, and the Monaghan Way, as it approaches and passes under the development.

These effects are generally reflected in the applicant's photomontages, Nos. 2 and 3 and the additional photomontages A and B submitted at the oral hearing (submission No. 13a). The Board may also wish to review some of the third party photographs submitted to the oral hearing in respect of Lemgare Rocks, and the Monaghan Way e.g. from Anne Murray, CMAPC, Martin Traynor and Philip Collins.

However, the photomontages do not reflect the collective impact of Towers 108 and 109 and associated conductors which would be perceived simultaneously by walkers passing under the line. I would conclude therefore that the proposed development would have a significant adverse impact on a short section of the 56km Monaghan Way and I note that this is the conclusion set out in the landscape assessment of the EIS (Section 11.9).

In the vicinity of Tower 108 the proposed development oversails an area called 'Lemgare Rocks' (OSi, 25" historic maps). The observers argue that this rocky

outcrop provides extensive views of the surrounding countryside and that the proposed development would seriously detract from it.

I note that the elevated outcrop is not identified in the County Development Plan as an area of amenity or as a protected view. I also note that they outcrop is on private land and there is no public access to it or clear views of it from the public road. Whilst I would accept that the proposed development will adversely affect the setting of the outcrop and views from it, in the absence of statutory protection of public access, I do not consider this impact to be significant.

The proposed development crosses the N2 between Towers 122 and 123. The landscape in this area is relatively flat and open and the proposed development will be clearly visible, in particular within 500m of the alignment (Photomontages 8 and 9). However, it will be seen within a context of the built structures associated with the N2 and existing roadside development. Furthermore, impacts will be short term as motorists pass under the line. I do not consider the impact of the development on the short length of the N2 to be significant.

As the proposed development makes its way through County Monaghan it crosses numerous public roads and will be visible from others. However, for the most part, views of the line will be intermittent due to the undulating topography, rural development and roadside vegetation. Impact of the development on the public road network is therefore likely to be very local, confined to the immediate environs of the route and to specific vantage points from it.

b. <u>County Cavan</u>

Observers raise concerns regarding the impact of the development on Lough an Lea Mountain walking route. This circular route around the mountain provides views towards the proposed development from the eastern side of the mountain and has been discussed above.

c. <u>County Meath</u>

Observers draw the Board's attention to the impact of the proposed development on a local (undesignated) cycle route in the Moynalvy, Derrypatrick, Batterjohn and Kiltale area. The proposed development is routed through this area but through agricultural land which is generally removed from the public road network. With roadside vegetation, views of the line will be restricted to intermittent views from the public road network and to views of the line as it crosses a road. I do not consider therefore that the development would significantly impact on the amenity of this route.

The Boyne Valley Driving Route is a substantial circular Discover Ireland Driving Route which connects significant regional and local visitor attractions in the area including the Battle of the Boyne, Hill of Tara, Trim Castle, Kells, Slane Castle etc. The proposed development crosses this Driving Route twice, at the R147 south west of Donaghpatrick, between Towers 311 and 312, and at the L2203 south west of Bective Abbey, between Towers 357 and 358. Discover Ireland's map of the route includes the local road to the north of the R147 from the regional road to Donaghpatrick Church and the local road from the L2203 to Bective Abbey (see attachments).

In the vicinity of Donaghpatrick, Towers 311 and 312 are located on each side of the Driving Route between Kells and Navan. Nearby visitor attractions, identified in the Driving Route, are Donaghpatrick Church and the site of the Ancient Tailteann Games, both north of the R147 and River Blackwater. As travellers on the route approach and pass under the proposed overhead line, the nearby towers and overhead cables are likely to detract from the visual amenity of the immediate area, including views towards Donaghpatrick (see Photomontage 55). However, the Driving Route, at this point, comprises the busy R147 with some roadside development and roadside vegetation which prevents clear views across the adjoining landscape. Impact on the amenity of the route along the R147 is therefore limited.

With regard to the local road from the R147 to Donaghpatrick Church, towers will be visible in some views from this local road and from the Church itself (Photomontage 56 and 57). Further, the development will be visible from the

public road network travelling to and within Teltown (e.g. Photomontage 58 and 59).

In the vicinity of Bective Abbey, the proposed towers are located each side of local road L2203 (Tower 357 and 358) south west of Bective Abbey. As noted in the EIS the landscape in this area of the route is particularly flat and open and the overhead line and towers will be particularly visible to road users as they pass close to it and under it (Photomontages 67 and 67A). From Bective Abbey (which is an identified attraction along the driving route) views of the towers will be possible from the grounds and steps of the Abbey.

Having regard to the above, it is evident that the proposed development will introduce substantial physical structures in close proximity to two short sections of the driving route and into the wider landscape setting of a small number of nearby visitor attractions. I would accept therefore the applicant's conclusion that the proposed development will have a resultant significant adverse impact on two short sections of the Boyne Valley Driving Route.

5.14.5.5. Impact on Demesne Landscapes

A number of observers, including Monaghan and Meath County Councils, Michael O'Donnell (SC) on behalf of Brittas Estate and Dr. John Olly, draw the Board's attention to the impact of the proposed development on demesne landscapes within the route corridor.

NIAH Survey of Historic Gardens and Designed Landscapes

The NIAH garden survey was carried out to initially to identify the extent of the State's historic gardens and designed landscapes. As I understand sites were identified using the 1st edition Ordnance Survey maps and these were compared with aerial photography to assess the level of survival and change. The NIAH states that the assessment is not an indication of a site's heritage importance and I note that to date, the demesnes as listed in the survey, have no statutory

protection. However, they are afforded protection under the policies of the Monaghan and Meath County Development Plans.

Demesne Landscapes within the Route Corridor

Within 1km of the proposed development are 16 demesnes identified in the National Inventory of Architectural Heritage Survey, two in County Monaghan (Shantonagh House and Tully House) and 14 in County Meath (Whitewood House, Brittas, Cruicetown, Rahood, Drakerath House, Mountainstown House, Dowdstown House, Teltown, Gibstown, Ardbraccan House, Churchtown House, Philpotstown, Galtrim House and Culmullin House).

A number of these properties are also protected structures and the impact of the development on these is discussed in detail in the Cultural Heritage section of this report. This section of the report (here) focuses on the landscape and visual effects of the development on these demesnes.

I note that the applicant has not had access to any of the demesne lands and is not therefore able to assess features of the demesnes on the ground, for example, views of vistas, avenues, woodland, parkland or water features that remain. Within this context, I comment briefly on each of the demesnes below:

a. County Monaghan

The proposed development is routed through the demesne lands originally associated with Tully House (Towers 172 to 174). The demesne is described in the NIAH as 'virtually no recognisable features remaining' and I would accept that many of the features originally present in the first edition OS maps have disappeared. In view of this I would consider that the proposed development would not have a significant impact on it.

Shantonagh House Demesne lies immediately north of, and adjoins, Tully House Demesne. The proposed development runs through the demesne lands (Tower 171) on their eastern side (Figure 11.5, Vol. 3C). The demesne is described as having 'main features substantially present, peripheral features unrecognisable'. As noted by the applicant (Response document), there have been changes in the landscape since the early edition OS maps, for example with the removal of stands of woodlands around the house and alterations to the house itself. However, I do note that some treelines remain within the demesne land and woodland on the eastern periphery of the demesne.

Whilst I would accept therefore that Shantonagh Demesne is degraded, with the loss of original features, the proposed alignment through it will add to this degradation and will detract from any features which do remain, including the woodland to the east of the alignment. In the absence of information on the nature of these features, I would adopt a precautionary approach and conclude that the proposed development will have a negative impact on the demesne lands.

b. County Meath

The proposed development runs to the west of Whitewood Demesne, with the closest tower, Tower 259 c.1km from the demesne lands (Figure 17, Vol. 3B). The NIAH describe Whitewood Demesne as '*main features substantially present – peripheral features unrecognisable'.* Sitting on an elevated site, the front elevation of Whitewood House faces the R162 to the east, and the rear overlooks Whitewood Lough. Landscape features which are apparent in the first edition OS

maps include avenues to the east, framing the entrance to the House, to the west towards Whitewood Lough and south west towards Cruicetown. There is also substantial woodland planting to the north, west and south west of the House. Current aerial photography indicates that much of this woodland to the north, west and south west of the house has been removed and with it the framed views towards Whitewood Lough and Cruicetown.

The proposed development would not impinge directly on the estate lands or designed gardens. However, in views from the demesne to the west, as acknowledged by the applicant, towers are likely to be visible as they descend a ridgeline to the west of Whitewood Lough and detract from views from the demesne lands. Whilst these would no longer interrupt framed views, they would nonetheless detract from significant views from the demesne lands. I would consider therefore that the development would have a negative impact on the setting of the demesne and views from it.

The proposed development is routed through Brittas Estate with Towers 266 to 270 running inside the western boundary (Figure 18, Vol. 3B). The NIAH Garden Survey describes Brittas as '*main features substantially present – some loss of integrity'.* First edition OS maps indicate substantial woodland around the main house and along the avenue to it, parkland, formal planting and routes through the landscape. General Bligh's battlefield and Mausoleum are also evident to the east of the demesne lands. Current aerial photography would indicate that many of these features remain.

As stated the proposed development traverses the western side of the estate lands, crossing the current main avenue to Brittas House and the original avenue to the north. The development will result in the loss of c.1.1ha of mature woodland along its alignment and introduce substantial contemporary structures to the demesne lands. This alignment, whilst keeping to the west of the demesne lands and removed from Brittas House, will no doubt detract from the integrity of the landscape, views to be had from its avenues and views from landscape features within the demesne (e.g. the battlefield and Mausoleum). Whilst there has been no access to lands or therefore detailed assessment of impacts, the applicant

accepts that the proposed development will have a significant, permanent, negative impact on the demesne and I would concur with this.

A number of alternatives to avoid this residual impact have been considered by the applicant, including moving the OHL to the immediate west of the public road, further west towards Cruicetown, to the east of the estate and undergrounding. However, these have been discounted primarily due to the consequences for other environmental receptors. These matters are considered further in the Cultural Heritage section of this report and the option of partial undergrounding is considered below.

The proposed development runs c.1.25km to the east of Cruicetown Demesne, with the nearest tower, Tower 270 lying within the Brittas Estate (Figure 18, Vol. 3B). This demesne is described in the NIAH Garden Survey '*main features unrecognisable – peripheral features visible'.* The proposed development is physically removed from the demesne and is visually separated from it by a prominent ridgeline between it and Brittas Estate. Having regard to these factors and the degraded state of the demesne, I do not consider that the proposed development would adversely impact on it.

The proposed development passes through the original lands associated with Rahood Demesne and Towers 274 and 275 lie within the demesne (Figure 19, Vol. 3B). This small demesne is described as having '*virtually no recognisable features'* and current aerial photography illustrates substantial changes in features. Within this context, significant impacts on the demesne are unlikely to arise.

The proposed development is routed through the original lands associated with Mountainstown Demesne, with Tower 289 within the estate (Figure 21, Vol. 3B). The NIAH Garden Survey describes this large demesne as '*main features substantially present – peripheral features unrecognisable'.* (NB the applicant's Response document wrongly describes these as 'main features unrecognisable – peripheral features visible'). The first edition OS map indicates woodland planting

in blocks, within the vicinity of the house, to the west of the demesne and along avenues within the demesne. Current aerial photography indicates that much of this planting remains, including that extending west along avenues from the house.

The proposed development lies over 900m to the west of Mountainstown House. It is routed in a north south orientation through the demesne lands and would appear to cross one of the original tree lined avenues. I would consider, therefore, that the proposed development would detract from the overall integrity of the demesne and from the amenity, value and setting of remaining features of the demesne. I would consider that it would have a permanent, negative moderate impact on it.

To the south of Mountainstown Demesne, is the smaller Dowdstown Demesne. The proposed development lies to the west of this demesne, with Tower 290 c.350 to the north west of the demesne (Figure 21, Vol. 3B). The NIAH Garden Survey describes Dowdstown Demesne as '*main features unrecognisable – peripheral features* visible' and aerial photography would indicate that much of the original woodland planting to the south and south east of the house has disappeared. Notwithstanding this, as stated by the applicant in the Response document, views of the development are likely to be visible from the avenue to the house and the development would detract from the setting of the demesne.

The proposed development is routed through the lands originally associated with Teltown Demesne, with Towers 309 and 310 to the east of the demesne (Figure 23 and 23, Vol. 3B). The NIAH Garden Survey describes Teltown Demesne as '*main features unrecognisable – peripheral features visible'* and aerial photography would suggest that the many of the features that surrounded Teltown House (to the west of the demesne) have been lost. Remaining features appear to be field boundaries and associated planting. The proposed development would appear to cross some of these features, notably a tree lined lane within the demesne but I note that there has been residential development also along this lane. Having regard to the generally degraded nature of this demesne and I would consider that significant impacts are unlikely to arise.

The proposed development passes to the west of Ardbraccan Demesne, with Tower 324 c.625m to the west of the demesne lands (Figure 25, Vol. 3B). The NIAH Garden Survey describes Ardbraccan Demesne as '*main features substantially present – some loss of integrity'.* The proposed line is substantially removed from the demesne and would have no direct impact on the demesne lands. Furthermore, the proposed development is separated from the estate by the M3 and the estate itself enjoys mature vegetation along much of its western boundary. Impacts on the integrity of the demesne, views or vistas from it, are therefore unlikely to be significant.

The proposed development passes to the east of Churchtown House, with Tower 337 c.150m to the north east of the House. The NIAH Garden Survey describes this small demesne as '*main features substantially present – peripheral features unrecognisable'*. The proposed development would have no direct effect of the demesne as it is removed from it. However, as it is in such close proximity to it, the development will impact on its setting and views from the demesne lands. The applicant considers the impact to be of moderate significance and I would accept this.

The proposed development is routed through Philpotstown/Dunderry Park Demesne with Towers 340 and 341 sited in the demesne (Figure 27, Vol. 3B).

The NIAH Garden Survey describes Philpotstown Demesne as '*main features substantially present – peripheral features unrecognisable'*. The first edition OS maps indicate woodland planting around the main house, along field boundaries and avenues to the west and east. The proposed development travels centrally through the demesne lands and will cross a number of mature treelines (requiring in some instances their removal) and will traverse the entrance to the demesne from the west. The development would also be visible from the avenue to Philpotstown House to the east. In view of these impacts, I would consider that the development will detract from the overall integrity of the demesne and from the value and setting of remaining features.

The proposed development lies to the east of Galtrim Demesne, with Tower 381 lying c.100m north of it (Figure 32, Vol. 3B). The NIAH Garden Survey describes Galtrim Demesne as '*main features substantially present – peripheral features unrecognisable'*. The first edition OS map indicates avenues, parkland and woodland planting to the in the vicinity of the Galtrim House which lies to the west of the demesne approximately c.600m from the proposed development. In the vicinity of the proposed development, it would appear that some original hedgerows/field boundaries remain and some small stands of woodland. Having regard to the location of the development outside of the demesne lands, removed from the main and remaining features of the demesne, significant impacts are unlikely to arise.

The proposed development lies to the west of Culmullin Demesne, with Tower 396 c.350m to the west of the demesne lands. The NIAH Garden Survey describes this small demesne as '*main features substantially present – peripheral features unrecognisable'*. Aerial photography would indicate that much of the woodland planting around the house remains. Whilst no direct impacts on the demesne will occur the development is routed in reasonable proximity to it in a flat, open landscape, and it may detract from its setting and/or views from the demesne.

Summary of Impacts on Demesnes

In summary, the proposed development is routed in close proximity to 7 demesnes, Whitewood, Cruicetown, Dowdstown, Ardbraccan, Churchtown, Galtrim and Culmullin. Due to the proximity of the proposed development to some of these and views of the OHL from the demesne lands, the proposed development is likely to detract from the setting and/or views from Whitewood, Dowdstown, Churchtown and Culmullin.

The development is also routed through a further 7 demesnes, Tully, Shantonagh, Brittas, Rahood, Mountainstown, Teltown and Philpotstown. A number of these are significantly degraded with few features remaining and I do not consider that significant impacts would arise as a consequence of the development (Tully, Rahood and Teltown). For Shantonagh, the development is likely to further the

degradation of the demesne lands and detract from the amenity and setting of remaining features. For Brittas, Mountainstown and Philpotstown the development will impact on the integrity of the demesne landscape and on the value and setting of landscape features which remain. However, for Brittas demesne which retains many of its original features, the impact of the development, in close proximity to remaining landscape features and crossing the main avenues of the estate, will be most significant.

During the course of the oral hearing Dr. John Olly drew the Board's attention to the impact of the proposed development on the collective landscape of Whitewood, Brittas, Cruicetown and Rahood. I would accept that landscape is one which has a concentration of historic designed landscapes in a small geographical area and that historically these landscapes may have been connected. However, today some of the landscapes associated with the demesnes have declined (e.g. Rahood, Cruicetown) and the demesne landscapes which remain appear as 'islands' in a contemporary working landscape, with limited inter-visibility or collective landscape presence. Therefore, whilst the proposed development will result in landscape and visual impacts on the corridor through which it passes, including this small geographical area, I do not consider that it will impact on this collective.

5.14.5.6. Impact on Settlements.

Numerous observers, including CMAPC and NEPPC, draw the Board's attention to the impact of the proposed development on villages/townlands in proximity the route.

A number of these are either quite removed from the route (e.g. Doohamlet, Ballybay, Shercock, Kingscourt, Moynalty, Wilkinstown, Kiltale, Batterjohn) and others whilst nearer remain are separated by topography and/or vegetation (e.g. Kilmainhamwood, Nobber, Clongil, Oristown, Bohermeen, Boyerstown, Rataine, Derrypatrick, Culmullin). For each of these, I do not consider therefore that significant adverse effects will arise as a consequence of the development.

Other settlements or townlands lie in closer proximity to the line and I discuss these below.

a. County Monaghan

Cashel is a townland c.3.5km to the south east of Clontibret. It lies to the east of the N2 (and old N2). Development in the area typically comprises one off housing and agricultural development along public roads in the area. Towers 119 to 121 lie to the on the slopes of drumlins (with the topography falling towards the N2) and Towers 122 to 126 to the west in a flatter and more open landscape. Towers 119 and 120 are transposition towers and are taller than most towers (45.98m and 50.98m respectively). The visual impact of the development is depicted in Photomontages 7, 8 and 9 and I would accept that local visual impacts will be significant.

Between Tower 177 and Tower 181 the proposed development runs through the townland of Cornasassonagh and between Towers 180 and 181 it will cross the existing Lough to Rathrussan 110kV OHL (Figures 8 and 9, RVIA). As discussed above, impacts on landscape character and on residential property are likely to occur within 500m of the route alignment. I note that in this area there is quite a concentration of rural housing along the public road network, including along Cornasassonagh Lane (between Towers 178 and 179). I would consider that the proposed development would impact on this community by virtue of landscape and visual effects and local cumulative impacts with the existing 110kV line.

b. County Cavan

Muff is a small rural village lies that lies c.3km to the west of Kingscourt. The proposed development runs to the north west of Muff Lough and turns at angle Tower 228 to run in a southerly direction c.390m to the west of Laragh National School (Figure 14, RVIA). Muff Fair, an annual longstanding horse fair, takes place on land to the south of Tower 227 between the two public roads (see Photomontage 39). Again, there is a concentration of properties in this area and I consider that the proposed development, by virtue of the prominent towers and

overhead conductors, will adversely impact on this cluster of properties and on the setting of Muff Fair. I note that the EIS draws similar conclusions (Section 11.9, Volume 3C, EIS). Impacts on Laragh National School (in Muff) are discussed in the section of this report on Human Beings - Tourism and Amenity.

Balloughy is a townland c.2.5km to the south of Muff. It lies north east of the proposed development as it turns through a right angle at Tower 237 (Figure 11.6, Vol. 3C). The existing Louth to Arva 220kV line runs in a north-west south-east alignment and the proposed development would cross it between Towers 234 and 235, to the north west of Balloughy (Figure 11.6, Vol. 3C). Between the existing 220kV OHL and the proposed development there is a cluster of properties to the north east of Tower 237 (Figure 15 of 35, RVIA). Whilst these lie within 500m of the proposed development the area has substantial tree cover and the topography is undulating such that it would be difficult to read the existing and proposed OHLs together from the public road. Views of the proposed development itself from the public road network would also limited and intermittent. I would conclude therefore that the proposed development would not significantly impact on this cluster of properties.

c. <u>County Meath</u>

Between Kells and Navan, the proposed development is routed through the townlands of Teltown, Gibstown and Donaghpatrick. The area is characterised by substantial residential development along the public roads in the area, and the attractive cluster of traditional buildings and structures around Donaghpatrick Church. The proposed development is routed to the west of Donaghpatrick and Gibstown and to the east of Teltown, midway between public roads to the north west of Donaghpatrick (Figure 24, RVIA). It will cross the existing Arva to Navan 110kV line just north of the Tower 308.

The proposed development will be visible from residential properties and from the public road network in the vicinity of the route, from Donaghpatrick Church and from Gibstown Cemetery (see Photomontages 51 to 59). Whist I accept that the

rural environment is diminished by substantial ribbon development, the proposed development, at an ‘industrial scale, will nonetheless detract from the visual amenity of the area, and the pastoral river environment in particular.

The townland of Irishtown lies just north of the N51. It is characterised by substantial ribbon development along the public road network. The proposed development runs east of the public road between Towers 330 and 335, following the alignment of the public road (which runs approximately north south). Again, as elsewhere the proposed development will detract from the visual amenity of the area through which it passes. In this instance a small number of properties lie in close proximity to the route (near Towers 332 and 334) and I would accept that the development would have a significant and adverse impact on this cluster. This impact is reflected in the RVIA.

The proposed development lies c.500m to the east of Dunderry as it travels through the Philpotstown demesne (Figure 28, RVIA). Whilst removed from the village the development will be highly visible from the approach to the village from the east, run through the lands used for Dunderry Fair and will be visible from Dunderry graveyard (Photomontages 61 and 62). I would concur therefore with the findings of the EIS that the development will have a significant impact on the outskirts of the settlement.

Robinstown village lies c.500m north of the proposed development and Robinstown National School, c.600m north of Tower 350. The village lies in a flat landscape, however, existing development within the village and mature hedgerows would limit views of the development from the village. I would not consider therefore that the development would give rise to significant impacts on the village.

In summary, I would accept that the proposed development will have an adverse impact on a small number of settlements, notably Muff, Teltown/Gibstown/Donaghpatrick and Dunderry.

5.14.5.7. Impact of Construction Phase on the Countryside

The observers refer the Board to the impact of the construction phase of the proposed development on the countryside.

Impacts will arise as a consequence of the removal of vegetation (see below) and visual presence of construction traffic. It is considered below that the impact of vegetation removal during construction will occur over the short term and, having regard to the proposed construction methodology, will not be significant. Similarly, the visual effects of construction traffic will occur for a relatively short period, at isolated and small construction sites and over a dispersed geographical area. Impacts are unlikely, therefore to be significant.

5.14.5.8. Visual Impact of Vegetation Removal

Observations draw the Board's attention to the impact of tree and hedgerow removal during the construction phase of the development (including from the use of temporary access routes) and the long term impact of mature tree and hedgerow loss to accommodate the development.

I note that that during construction mitigation measures will be put in place to minimise the physical landscape effects arising from construction, including the use of existing routes/gaps in hedgerows, reinstatement of hedgerows and ground vegetation, protection of retained vegetation, sensitive vegetation pruning methods and monitoring of vegetation re-establishment. I also note that the applicant has stated that construction equipment will be used which is commensurate with the width of existing access points and that a suite of mitigation measures is proposed to protect soils. Subject to the implementation of these measures, I consider that the temporary landscape effects of construction can be minimised and will not give rise to significant impacts.

With regard to the permanent effects of vegetation removal, I note that (a) the EIS does identify the location of hedgerows, treelines and woodlands falling within the route corridor (Figures 6.2.1 to 6.2.18), and that (b) the extent of vegetation to be

cleared or permanently trimmed as a consequence of the development has been quantified. However, I would accept that the impact of vegetation removal is not depicted visually i.e. the photomontages specifically do not show the permanent localised trimming or removal of taller vegetation required by the development (Section 11.2.8, paragraph 35, Vol. 3C). It is possible therefore that significant but localised impacts will arise, for example, with the felling of mature treelines within the Philpotstown demesne (north of Towers 342 and 341).

5.14.5.9. External Appearance of Proposed Construction Materials Storage Yard

Monaghan County Council draws the Board's attention to the absence of drawings to indicate the visual appearance of the construction materials storage yard (e.g. if materials are to be placed on racking etc.).

Drawing Nos. MT009-001 to MT009-004 illustrate the layout and proposed uses within the materials storage yard together with fencing and sightlines. The external appearance of structures is not apparent from the drawings, e.g. height of racking etc. However, this matter can be readily dealt with by condition.

5.14.5.10. Visual Impact of Flight Diverters

The observers draw the Board's attention to the additional visual impact of flight diverters. Whilst I accept that these will be visible on the conductors at close quarters, having regard to their relatively modest size and form, in the context of the scale of the proposed development, I do not consider that they will add significantly to the overall visual effect of the development.

5.14.5.11. Cumulative Effects of Development

The observers draw the Board's attention to the potential cumulative landscape effects of the proposed development with other existing and proposed development, notably existing electricity infrastructure and wind farms.

Cumulative impacts are addressed by the applicant in Chapter 10 of Volume 3B. A number of the developments referred to are relatively small in scale (e.g. extant residential development), visually removed from the proposed development (e.g.

Dublin to Navan Rail Project, Ardee Bypass) or entail upgrading of existing infrastructure. I comment briefly below on the more substantial projects which are either in place, approved or proposed in the Cavan, Monaghan and Meath area and the possible cumulative impacts arising from them.

Overhead Line Infrastructure

The proposed development will traverse existing high voltage and lower voltage overhead lines and telecommunication lines along the route corridor. These are detailed in the applicant's report *North South 400kV Interconnection Development Identification and Resolution of Conflicts with Existing Overhead Line Infrastructure* (Vol. 3B, Appendix 7.3) and Planning Drawings MT002-001 to MT002-003, Vol. 1B (existing HV OHLs).

Essentially it provides that the three 110kV OHLs which the route crosses will be lowered in the vicinity of the route and all other lower voltage lines and telecommunication lines will be placed underground, in the vicinity of the route, in advance of construction works. No alterations are proposed to two existing 220kV OHLs as there is sufficient clearance between them and the proposed development.

The visual effects of the development traversing existing lines, even with undergrounding of lower voltage lines and telecommunication lines, will give rise to local cumulative visual impacts. Some of these impacts are depicted in the applicant's Photomontages, including numbers 11, 21, 42, 52, 58 and 59. The greatest impacts are likely to arise where intersections are visible from the public road network. For example, where the proposed development crosses the Louth to Flagford 110kV OHL near Tower 181 and where it crosses the Arva to Navan 110kV OHL near Tower 307 in Donaghpatrick. However, as concluded previously, the visual effects of the development dissipate with distance. Similarly, I would expect cumulative impacts to typically be confined to a small geographical area where both intersecting lines read together. This type of impact is reflected in the

applicant's photomontages. I would consider, therefore, that cumulative effects of the development with existing OHLs will generally be very localised.

The current Oldstreet to Woodland 400Kv OHL will support the proposed development along its northern side (Towers 402 to 410) for c.3km. No new towers will be introduced and visual impacts will therefore be very limited and cumulative impacts equally modest. I do accept however that the proposed development, in conjunction with existing high voltage OHLs extending from Woodland substation will add to the dispersed visual impact of OHLs in the vicinity of Woodland substation (MSA Line Route Map, Planning Drawings, Sheet 3, Vol. 3B).

Leinster Orbital Route

The proposed development traverses the proposed corridor of the Leinster Orbital Route (between Towers 342 and 354). Local cumulative visual impacts may well arise as a consequence of both pieces of infrastructure. However, the LOR is still at a planning stage and site specific impacts, should they arise, will be adjudicated once an application for approval comes forward.

Windfarms

Five windfarms are either approved or proposed in the vicinity of the proposed development[88].

- *Lisduff Wind Farm* (PA 10485 etc.) - Granted by Monaghan County Council in 2011 (and subsequently modified). It comprises 8 wind turbines and lies c.1km to the west of the proposed development (Towers 155-160).
- *Raragh Wind Farm* (PL236608) - Granted by the Board in 2010. It comprises 7 turbines and lies c.2km to the east of the proposed development (Tower 220).
- *Teevurcher Wind Farm* (PA 120679) - Granted by Meath County Council in 2013. It comprises five wind turbines lies c.2.4km to the west of the

[88] NB An application for windfarms at Crag (PL17.244357) and Emlagh (PA0038) were refused by the Board.

proposed overhead line (Tower 234) and to the east of the village of Teevurcher, Co. Meath (Figure 10.1, Vol. 3B).

- *Castletownmoor Wind Farm* (PA0046) - Submitted to the Board in August 2016. It comprises the development of 25 wind turbines in clusters on land to the west of the R162, between the N52 and Wilkinstown in County Meath. Turbines are proposed on land in close proximity to the alignment, mostly to the west of it, but with a smaller number of turbines to the east of the proposed OHL. (The development is similar to, but smaller than, that refused by the Board under PA0038 (Emlagh).
- *Maighne Wind Farm* (PA0041). Submitted to the Board in 2015. It comprises a wind farm of 47 turbines in 5 clusters in north Co. Kildare, south Co. Meath. The nearest of the five clusters is located c.15.6km from the proposed development. It was refused by the Board on the 12th October 2016.

The three approved windfarms at Lisduff, Raragh and Teevurcher lie within reasonable proximity to the route. However, topography is typically undulating and, whilst it will not always be possible to read the developments together, cumulative visual impacts are likely to arise where both can be observed and where the proposed OHL is dominant (where turbines are dominant, the proposed OHL which is smaller in scale, is likely to be less evident).

The applicant has examined likely visual impacts arising from wind turbines in the Castletownmoor area, in respect of the previous application PA0038 (Emlagh wind farm). The applicant concluded in respect of this previous development that cumulative impacts would be likely to arise, and would be most significant where the viewer is in close proximity to the transmission line and when turbines are visible (Photomontages 48A, B and C, 49, 50, 50A and 54) (Section 10.4.7, Vol. 3B). The proposed Castletownmoor windfarm also proposes wind turbines in close proximity to the proposed development and I would accept that similar cumulative impacts are likely to arise. As the visual impact of the proposed development reduces with distance, again I would consider that cumulative effects will diminish as one moves away from the OHL.

Future Electricity Related Development

Section 10.6 of Volume 3B examines the likely cumulative impact of the development with other planned electricity development. This includes a possible sub-station in the Kingscourt area and the location of electricity generator substations for Gate 3 project connection offers (possible turbines, wind farms and biomass facilities) within 10km of the proposed development (Figure 10.5, Vol. 3B).

The EIS acknowledges that any sub-station in the drumlin landscape in the Kingscourt area is likely to result in cumulative landscape and visual effects and I would accept this conclusion and I would anticipate that significant local cumulative impacts may well arise.

For Gate 3 projects, the EIS states that whilst cumulative landscape and visual effects will depend on the exact location of future developments, these are likely to be locally significant for any windfarm with five or more turbines, within 5km of the proposed development. Highest visual impacts are anticipated to occur where a view is located within 1km of the transmission line and where views of both towers and turbines are possible. Again I would accept this conclusion and consider that, if brought forward for approval, it is likely that local cumulative effects could arise.

Cumulative Effects on Landscape Character

Whilst I accept that development coming forward in the region has the potential to substantially alter the character of the rural landscape (e.g. to 'industrialise' it), I do not consider that the proposed development will generally give rise to this type of cumulative impact. This is primarily due to:

- The relatively narrow corridor that the proposed development visually impacts on,
- The limited geographical extent of cumulative visual impacts that may arise,

- The lack of substantial inter-visibility between the proposed development and other existing and proposed development, and
- Therefore, the absence of collective dominance in the landscape of these land uses.

I would accept, therefore, the conclusions of the EIS that the landscape and visual resource of the wider assessed area along the route will not be adversely affected by the development itself or as a consequence of the cumulative effect of the development with other permitted or planned development.

5.14.5.12. Options for Partial Undergrounding

Appendix 5.1 (Vol. 3B) considers the potential for undergrounding of the line to mitigate significant residual landscape and visual impacts in the following areas:

1. An area around the Boyne Valley,
2. An area around the Blackwater Valley,
3. The Benburb Area (Co. Tyrone/Armagh),
4. Brittas Estate,
5. An area in the Mullyash Uplands (plateau & valley close to border/Monaghan Way),
6. The setting of Muff Fair/Cavan Highlands.

For the application in this State, I would accept that the areas identified comprise those where the most significant visual and landscape effects are likely to arise (and which could be mitigated by partial undergrounding).

For each, the report acknowledges that on landscape grounds undergrounding would reduce the extent of the visibility of the proposed development for short lengths and would be the preferred option (even with consideration of sealing end compounds arising from an underground option). However, it also considers that:

a. For all other environmental impacts there is no preference for undergrounding (except for the Brittas Estate).
b. The underground option typically presents:

- Greater potential risks to receptors during construction e.g. ecology, water, soils and hydrogeology, and
- Greater adverse impacts for some receptors e.g. agronomy, traffic and cultural heritage.

c. As no profound impacts arise (which would obliterate sensitive characteristics) there is no justification for consideration of partial undergrounding.

Having regard to the technical assessments carried out and presented in the report (Appendix 5.1, Vol. 3B), I would accept that the construction of an underground route may pose greater risk to some environmental receptors during construction (e.g. ecology, water, soils) or result in greater impacts (e.g. traffic). However, I note that these impacts referred to are typically short term and ones which can generally be managed by appropriate construction practices. In addition, for other impacts I consider that there would be benefits which are not referred to, for example, for tourism and amenity, for human beings (population and economic).

Notwithstanding the above, I note that on cultural heritage grounds there is a clear preference for an OHL as it would generate fewer, direct, physical, irreversible impacts on the non-renewable cultural heritage resource. Further, partial undergrounding would add significantly to the cost of the project, i.e. €94m to €174m.

In County Meath, the proposed development is routed through an area with substantial archaeological resources. To recommend an underground option may therefore trigger substantial impacts on this resource (notably in the Teltown and Bective areas). Furthermore, the proposed development has been routed strategically to avoid key landscape and cultural heritage resources in the study area (and other constraints). Within this context, and mindful of the significant costs involved, it is difficult to recommend that an underground option is pursued further.

With regard to Brittas, I note that the applicant's assessment of partial undergrounding in the vicinity of the estate, concludes that there is a minor preference for undergrounding in relation to landscape and a limited justification for undergrounding in relation to cultural heritage and ecology. However, it concludes that in the absence of profound impacts, there is no justification for partial undergrounding of the development in the vicinity of the estate.

Whilst I would accept that the proposed development will have a significant impact on the Brittas estate and that undergrounding would largely address this impact (and could be justified on other environmental grounds), I note the substantial cost associated with this option and the limited public benefits that might arise. Specifically, the estate is in private ownership, provides no public access and enjoys limited statutory protection. Furthermore, due to substantial vegetation along the western boundary of the estate, the proposed development would not be overly visible from the public road in the vicinity of the estate. Most benefits arising from undergrounding, would therefore occur within the estate and to a private landowner.

In the absence of public ownership or significant public interest in the estate or other public benefit arising from undergrounding, it is my view therefore that the undergrounding the development in the vicinity of Brittas Estate is difficult to justify.

5.14.5.13. Conflict with Policy

European Landscape Convention/National Landscape Strategy

The European Landscape Convention and Ireland's response document, the National Landscape Strategy, are strategic policy documents which aim to protect, manage and plan the European and national landscape resource. To date no landscapes of national importance have been identified within the State and the Board must adjudicate on the proposed development within the current policy framework as set out in the relevant County Development Plans.

County Development Plans

The policies and objectives of the Monaghan, Cavan and Meath Development Plans afford protection to landscape character and to identified landscape features.

For the reasons stated above, the proposed development will result in significant residual environmental effects on landscape character, on drumlins, on a small number of lakes in close vicinity to the proposed development, on two river valleys, on a small number of demesne landscapes and on the landscape setting of some historic features of the built environment.

The proposed development therefore conflicts in principle with the policies of the respective County Development Plans. However, the proposed development is a strategic infrastructure project of national interest. In a living landscape, it is difficult to envisage how any such project could be accommodated without impacting on its landscape setting. I note that the route selection and detailed design of the development has consistently sought to minimise landscape and visual effects, whilst balancing this objective with other environmental and technical considerations. I am of the opinion, therefore, that the alignment of the proposed development generally minimises impacts on the landscape and visual resource of the three counties through which it passes. It is considered that the impacts arising, whilst not ideal, are therefore acceptable.

5.14.6. Summary and Conclusion

The key issues arising in this section of the report relate to the landscape and visual effects of the proposed development.

Having regard to the matters discussed above, it is considered that the proposed development will give rise to significant adverse landscape and visual effects including significant impacts on:

- Residential property in close proximity to the route.

- Landscape character of the areas through which the development passes, including the drumlin landscape of Monaghan, Cavan and North Meath.
- Identified landscape features, including a small number of scenic views and lakes, the Blackwater and Boyne River Valleys, the Boyne Valley Driving Route and the Monaghan Way,
- A small number of demesnes landscapes, including Brittas Estate.
- A small number of settlements/townlands, including Muff, Teltown/Gibstown/Donaghpatrick and Dunderry.

Notably impacts will occur in close vicinity to the proposed development, generally up to 600-800m, but up to 1km in areas that are particularly elevated or open. Cumulative impacts are also likely to occur in close proximity to the development but not in the wider landscape.

It is considered that the partial undergrounding of the development is not warranted, primarily due to the excessive cost involved, the consequential impact on other environmental receptors and (for the Brittas Estate) the absence of wider public benefit.

It is acknowledged that the proposed development is inconsistent with many of the landscape and heritage policies of the Monaghan, Cavan and Meath County Development Plans. However, having regard to the project's status as a strategic infrastructure project of national interest and the approach adopted by the applicant to minimise impacts on landscape and visual effects at route selection and detailed design stage, it is considered that the resultant residual landscape and visual impacts, whilst not ideal, are acceptable.

5.15. Material Assets – General

5.15.1. Environmental Impact Statement

Impacts on material assets (general) are dealt with in Chapter 12 of Volumes 3C and 3D of the EIS. It identifies existing utility, aviation and waste infrastructure occurring within the study area, determines whether these features place constraints on the proposed development and assesses the impact of the proposed development on these assets.

For the CMSA, existing electricity lines and telecoms infrastructure include:

- The Flagford to Louth 220kV OHL,
- Three existing 110kV OHLs (Louth to Rathrussan, Lisdrum to Louth and Arva to Shankill),
- An extensive network of lower voltage lines and telephone lines.

There is one EPA licenced waste facility in the CMSA at Scotch Corner in Co. Monaghan. Other waste management facilities in County Monaghan, Cavan and Meath are listed in Appendix 7.2 of Volume 3C.

For the MSA, the existing baseline environment includes:

- A number of gas pipelines particularly around the main settlements.
- The existing Oldstreet to Woodland 400kV OHL.
- Three 220kV OHLs (Flagford to Louth, Louth to Gorman and Gorman to Maynooth).
- Three 110kV OHLs (Gorman to Meath Hill, Gorman to Navan and Arva to Navan,
- An extensive network of lower voltage lines and telephone lines.
- Trim Airfield c.1.2km to the west of the proposed development.
- A hot air balloon company operating in the Trim area

There are no EPA licensed waste facilities within 500m of the OHL in the study area. Other waste management facilities are listed in Appendix 7.2, Vol. 3D.

Potential impacts are predicted to arise from the construction of the OHL on utilities (e.g. interaction with existing utilities) and waste (e.g. disposal of spoil from tower sites). For the operational phase of the development, a small volume of waste is predicted to arise from the OHL.

Within both study areas the proposed means to traverse existing overhead lines are set out in the *North-South 400kV Interconnection Development Identification and Resolution of Conflicts with Existing Overhead Line Infrastructure* (Appendix 7.3, Vol. 3B).

Mitigation measures include:

- In respect of Trim Airfield, revisions to the formal approach procedure to the airfield to address the issue of the OHL and provision of marker spheres on the line between Towers 355 and 357.
- Preparation of a Construction Environmental Management Plan (based on the draft CEMP, Appendix 7.1, Vol. 3B) which includes detailed arrangements for the crossing of existing overhead lines, erection of guarding of road and railway crossings,
- A Construction Waste Management Plan to minimise waste and ensure that all waste arising will be managed in accordance with the relevant legislation and best practice guidance.

Following the implementation of mitigation measures, no residual impacts are considered to arise.

Chapter 12 is supported by the following:

- Outline Construction Environmental Management Plan, Appendix 7.1, Vol. 3B.
- Waste management facilities, Appendix 7.2, Vol. 3C and 3D.
- Medium and high voltage overhead lines in the study area, Constraints Drawings, MT-002-001 to MT002-003. Vol. 1B).

5.15.2. Policy Context

5.15.2.1. Waste Management

The Connacht-Ulster Region Waste Management Plan 2015-2021 covers nine administrative areas, including County Monaghan and County Cavan. The Plan sets out strategic policies for the management of waste within the region with a greater emphasis on preventing waste, the re-use of materials and a reduction in landfilling.

Similarly, the Eastern-Midlands Waste Management Plan 2015-2021 covers the administrative areas of 12 local authorities including County Meath. Coming forward within a similar European context the plan also places greater emphasis on preventing waste, the re-use of materials and a reduction in landfilling.

Monaghan County Development Plan 2013-2019 and Cavan County Development Plan 2014 - 2020

Policies and objectives of these County Development Plans:

- Support, in principle, the development of electricity and gas infrastructure in the counties (ERO 10 and ERO 11, Monaghan CDP; PIO108 and PIO114, Cavan CDP).
- The implementation of the regional waste management plan, and any subsequent plan (WMO 2, Monaghan CDP, PIO96, Cavan CDP).

Meath County Development Plan 2103 – 2019

Similarly, policies and objectives of the current Meath CDP:

- Facilitate energy infrastructure provision so as to provide for the further physical and economic development of the County (Policy EC POL 1).
- Require that all new development take account of the provisions of the regional waste management plan and the proximity principle (Policy WM POL 1).

Policies of the Plan do not provide policies specifically in respect of the Trim Airfield or ballooning. However, policies do state that the planning authority will take account of the advice of the Irish Aviation Authority with regard to the effects of any development on the safety and efficient navigation of aircraft (Policy TRAN POL 5).

5.15.3. Issues raised by observers during the course of the application and during the oral hearing

Issues raised in submissions on the application for approval and oral hearing can be summarised under the following headings:

- Increase in electricity infrastructure and interaction with existing infrastructure.
- Issues regarding waste arising.
- Impact on businesses/services.

The applicant's response to the issues raised is contained in Chapter 17 of EirGrid's submission to the Board of the 19th October 2016.

5.15.4. The Oral Hearing

Issues in respect of Material Assets - General were principally addressed in Module 1.16, of the oral hearing on the 7th April 2016 (Day 16). Issues were also raised in Module 1.12 (Planning Authorities), 1.8 (Construction) and 1.16 (Material Assets – Traffic) and by a small number of observers in Part 2 of the hearing.

Submissions were made by the following observers in Part 1 of the hearing:

- Toirleach Gourley, Senior Executive Planner, Monaghan County Council.
- Malcom White, Irish Balloon Flights.
- Paedar Connolly, Lough Egish Food Park.

In attendance for EirGrid were:

- Jarlath Fitzsimons, Senior Counsel.
- John Dillon, Senior Environmental Engineer, TOBIN.
- Rodney Fewings, Aviation Consultant.
- Damien Grehan, Director, Energy and Environment, TOBIN.
- Robert Arthur, Senior Consultant (Construction), ESBI.

5.15.5. Assessment

5.15.5.1. Interaction with Existing Infrastructure

Existing Overhead Lines

The observers draw the Board's attention to the substantial increase the proposed development will have on the number of pylons in the respective counties (notably Co. Meath) and the requirement that the line cross a large number of existing overhead lines and telecoms.

The proposed development comprises the construction of 299 no. new steel lattice towers over 100.5km (134 towers in the CMSA and 165 in the MSA). Whilst substantial in number, the proposed development is a linear project therefore its physical impact is dispersed. Furthermore, the development comes forward in an environment where there are currently a number of high voltage OHLs (400kV, 200kV and 110kV) as well as a multitude of medium voltage and low voltage lines and telephone lines.

The applicant's report *North-South 400kV Interconnection Development Identification and Resolution of Conflicts with Existing Overhead Line Infrastructure* (Appendix 7.3, Volume 3B) indicates the following:

- Three No. 110kV electricity transmission OHLs that the proposed development traverses will be lowered, prior to the commencement of the proposed development (Lisdrum to Louth 110kV line; Louth to Rathrussan 110kV line; Arva to Navan 110kV line).

- All electricity distribution OHLs which do not provide adequate clearance for the proposed overhead line will be placed underground, in the vicinity of the proposed development, prior to the construction of the proposed development.
- At 59 No. roadside locations where the proposed development crosses existing overhead telecommunications lines, the existing telecommunications lines will be placed underground by Eircom in advance of the proposed development to a set distance either side of the proposed 400kV line.

With regard to two existing 220kV lines which the proposed development traverses (Flagford to Louth 220kv OHL and Gorman to Maynooth 220kV OHL), these existing lines are already at an elevation which enables an adequate clearance between the existing lines and the proposed development to be maintained. No alterations to the existing lines are required.

Having regard to the above, I consider that the applicant has adequately demonstrated how the proposed development will be accommodated within the existing network of overhead lines.

Impact on Radio Stations

A small number of observers draw the Board's attention to the impact of the proposed development on radio stations in proximity to the route, with the EMFs from the OHL causing interference:

- Radio station c.250m from Tower 249.
- Radio station c.2.4km to the west of Tower 230.

My understanding of HVOHLs is that these can affect radio signals when in close proximity to the line, for example, when travelling under them. I would accept, therefore, the applicant's arguments presented during the oral hearing that at the distances referred to above, the proposed development would not substantially interfere with existing radio stations.

Impact on Wind Turbine

An observer draws the Board's attention to the impact of the proposed development on a wind turbine on his lands in the vicinity of Tower 196. In response to the observation made the applicant consider that the proposed development, at more than 300m from the closest tower, is sufficiently removed from the wind turbine so as not to affect it. Having regard to the distance involved, I would accept this argument.

5.15.5.2. Waste Management

Observers to the application for approval draw the Board's attention to:

- The absence of site specific investigations to predict the volume of waste arising,
- The likely significant volume of excavated material that will arise from the construction of foundations,
- Where the soils arising would be disposed of, having regard to the sites listed by the applicant being either nearing capacity or no longer holding a waste licence,
- Means to dispose of timber waste.

In addition, the Northern and Western Regional Assembly request that the Board consider the management of waste arising from the construction process in the context of the emerging policy for further landfill disposal in the (then) Draft Waste Management for the Connacht/Ulster Region. In particular, they state that the application may need to be more explicit on waste disposal, specifically on locations and environmental impacts.

The absence of site specific investigations was discussed in the Construction section of this report. For the reasons stated, it is considered that the methodology used to estimate the volume of waste arising is robust and acceptable for the purposes of environmental impact assessment.

In summary, the applicant estimates that a total of 32,500m^3 of waste will be generated by the development, broken down as follows:

- In the CMSA a total of 9,932m^3 of waste from tower construction sites.
- In the MSA, 12,098m^3 of waste from tower construction sites.
- 7,000m^3 [89] of waste from the clearance of the proposed materials storage yard in Carrickmacross.
- Approximately 3,500m^3 (equivalent to approximately 7,350 tonnes) of excess soils/sub-soils as a result of excavation works to lower the ground level and install foundations at the proposed extension to Woodland sub-station.

The proposed development will give rise to a relatively small volume of waste, having regard to the scale of the project. This is due primarily to the generally small footprint of each tower site and the relatively small pads of concrete required for foundation construction.

Details for the disposal of waste are set out in the EIS states which that:

- Waste arising from the proposed development will be managed in accordance with the prevailing legal provisions and with best practice guidance (Section 12.6.1.3.1, Vol. 3C and 3D).
- A Construction Waste Management Plan, to form part of the CEMP, will be implemented to minimise waste and ensure correct handling and disposal of construction waste streams.
- Key principles underlying the Plan will be to minimise waste generation and segregate different materials arising at source (including timber), to maximise reuse and recycling
- In practice, waste arising from construction is likely to be less than predicted as some soils will be retained on site for site restoration purposes (paragraph 50/61, Section 12.6.1.3.2, Vol. 3C and 3D).
- Surplus soil will be transported to a waste recovery facility and/or landfill site (listed in Appendix 7.2, Vol. 3C and 3D).

[89] On day 15 of the oral hearing, Mr Dillon, EirGrid, clarified that the 7,000 tonnes referred to in Appendix 13.8, Volume 3C, Appendices, should in fact refer to 7,000m^3.

Having regard to the above, I consider that the proposed development is consistent with the principles of the Connacht-Ulster Region and the Eastern-Midland Waste Management Plans.

I note that a number of the waste facilities referred to in Appendix 7.2 (Vol. 3C and 3D) are at capacity or that their licence may have expired prior to the commencement of development (if approved). However, I would accept that applicant's argument that the availability of sites changes with time (for example, between compilation of EIA and decision by the Board) as sites reach their capacity and others open.

Whilst I therefore accept in principle the approach of the applicant that the contractor will identify live sites at the time of construction and that material would be transferred to the nearest site, there is obvious ambiguity at this stage regarding where material will be transferred to, the haul roads to be used for transfer and how it may be re-used/recycled.

However, having regard to the relatively small volume of waste arising and principles set out in the EIS in respect of waste disposal, I consider that these matters could be dealt with by condition should the Board be minded to grant approval for the development. Specifically, this could require the applicant to furnish the relevant planning authority, three months in advance of construction, a detailed Construction Waste Management Plan to include the volume of spoil arising from each tower site, the proposed means of waste disposal, haul route to be utilised and detailed measures to demonstrate compliance with the relevant regional waste management plan.

5.15.5.3. Impact on Businesses/Services

Aviation

The observers draw the Board's attention to impact of the development on Trim Airfield. They argue that the location of the development relative to Trim Airfield would allow an insufficient margin of error and generate an unacceptable safety hazard for pilots (including student pilots) and instructors:

- On a westerly approach to the runway,
- To pilots required to carry out a forced landing if taking off from Runway 10 (directly towards development),
- To aircraft when the sun is low at certain times of year (western sky, reduced visibility for landing on Runway 28).

They also argue that the development would impact on electronic equipment used within the aircraft. Reference was made to a number of accidents involving power lines where in many cases the pilots were aware of the presence of power lines but had difficulties seeing them or judging distance to them (see Appendix 4 and 5 of NEPPC submission).

The observers also state that whilst the proposed development does not penetrate the obstacle limitation surface applicable to the airfield at Trim, the IAA Aerodrome Licensing Memorandum (ALM NO. 3. 2005) does state that certain objects which do not project above any obstacle limitation surface may constitute a hazard to aeroplanes, such as high masts or other skeletal structures. Finally, observers query the need for navigational lights on towers to assist aircraft etc. in their identification.

Trim airfield lies c.3km north east of Trim Town. It has one runway 10/28 which runs in an approximate east west direction. The proposed development lies to the east of the airfield running in an approximate south east to north west alignment to it. Tower 354 is the nearest to the runway (c.1.2km to the north east) but Towers 356 to 359 lie due east of the runway.

I note that the IAA do not object to the proposed development. They state that the towers and OHL will be below the obstacle limitation surfaces for aerodromes (i.e. the defined and protected airspace above and around the airfield which provides for safe take-off, landing and manoeuvring of aircraft) and recommend marker spheres between towers 355 and 357[90].

The IAA is the body responsible nationally, by statute, for the management of Irish controlled airspace and safety regulation of Irish aviation. Whilst I accept that the proposed development will introduce an additional hazard within the area of the airfield that will have to be taken into account and managed in flight planning, I would defer to the view of the IAA that the proposed development does not pose an unacceptable risk to aviation. In this regard, I also note that the IAA has not raised any concerns regarding the overhead line being considered as an obstacle under the IAA Aerodrome Licensing Memorandum (ALM No. 3 2005), the impact of the development on the use of electronic equipment, the future use of the airfield as a centre for pilot training or the need for the illumination of towers along the length of the line.

Impact on Medevac Helicopter Operations in Ireland

The observers draw the Board's attention to their concerns that the proposed development would threaten the safety of the EAS (Emergency Aeromedical Service), provided by Air Corps Helicopter, particularly in poor weather.

I note that the EAS has not made any observations on the proposed development. Further the EAS operates within the existing extensive network of high voltage, medium voltage and lower voltage overhead lines in the country. Whilst I accept that the proposed development will add to this network and will comprise an additional hazard to be managed in flight planning, I consider that this is a risk that can be managed (e.g. with Aeronautical maps and modern navigational equipment showing the location of OHLs). I do not consider that it poses an

[90] I note that the applicant's assessment of clearance, above Towers 357 and 358 and the overhead line where it is crossed by the extended centre-line of the runway, to the inner horizontal surface of the obstacle limitation surfaces, is +27m, +36m and +48m respectively (Appendix 12.1, Volume 3D).

unacceptable risk to the Medivac service. I note that the IAA have not raised any concerns in this regard.

Irish Balloon Flights

Malcolm White of Irish Balloon Flights (Trim) draws the Board's attention to his concerns that the proposed development comprises a very serious risk to ballooning events in the Trim area. In particular, he argues:

- The main launch sites for the company are in Trim itself (Porchfields), Athboy and Summerhill.
- Many of the balloon flights that are carried out cross, or, result in landings near the route of the proposed development (see Appendix 5, NEPPC submission on application).
- Given their lack of built in steerage, limited manoeuvrability and the orientation of the OHL relative to rising and setting sun[91] (making the OHL harder to see) the proposed development would pose a greater collision risk to balloon flights.
- 45% of all ballooning fatalities resulting from contact with power lines.
- Few balloon flights fly in the vicinity of the existing Gorman to Maynooth 220kV OHL (to the east of the balloon fly area, see Appendix 5, NEPPC submission on application).
- The development would have serious implications for the future of the business in Co. Meath, on the international Championships held in Meath (40-50 balloons in proximity to pylons would be an unacceptable risk) and businesses providing support services (e.g. the recent Trim Balloon Fiesta attracted 80,000 visitors to the area).

In respect of the proposed development, the IAA advise that balloon pilots have to take account of numerous hazards in their vicinity (including power lines) and plan their launch/flight to avoid known hazards. They state therefore that ballooning

[91] The third party stated that balloon flights occur in the early morning and early evening when weather conditions are stable.

activity should not be a reason to prevent changes to the existing landscape, including the construction of power transmission lines.

The flight tracks of Irish Balloon Flights hot air balloon flights are shown in Appendix 5 of NEPPC's submission to the Board (in respect of the application for approval) and in Figure 12.3 (Vol. 3D) of the application. It is evident from these records that, of the flights taken, a relatively small number of flights pass over the existing Gorman to Maynooth 220kV. Furthermore, the proposed development lying to the west of this existing high voltage line, would further encroach into the flight zone.

Whilst hot air balloons are permitted to fly over high voltage overhead lines, I would accept that the proposed development adds an additional risk to balloon flights in the area of Trim and under some meteorological conditions that it would prevent certain balloon flights. However, mindful of the advice by the IAA, the large area over which balloon flights occur, and the route of many flights, which do not cross the route of the proposed development, I would consider that the additional risk posed by the development is one which could be managed through appropriate launch/flight planning, without significant impact on Irish Balloon Fights.

Impact on Lough Egish Food Park

The observers draw the Board's attention to their concerns that the proposed development would have a negative impact on the image of the food park and food based commercial enterprises located within the food park.

Lough Egish Food Park lies to the south east of the proposed overhead line, c.1.2km south east of Tower 164. The overhead line is visually separated from the food park by virtue of the undulating topography and intervening vegetation (Figure 7, Vol. 3B). No direct or visual impacts will therefore arise.

The Land Use section of this report considers the impact of the development on the image of the agri-food industry and quality assurance schemes. For the

reasons stated it is considered that no significant effects will arise from the proposed development on the image of the agri-food industry or on participation in quality assurance schemes.

In view of the above, I would conclude that the proposed development is not likely to result in adverse impacts on Lough Egish Food Park.

5.15.6. Summary and Conclusion

Key issues arising for material assets (general) include the disposal of waste and the impact of the development on businesses/services within its vicinity.

Having regard to:

- The relatively small volume of waste predicted to arise as a consequence of the development,
- The applicant's approach to its, as set out in the application documentation, and
- Subject to condition requiring detailed plans for the disposal of waste to be submitted to planning authorities prior to commencement of works,

It is considered that arrangements for the disposal of waste are consistent with the current policy framework for waste disposal and are acceptable.

Having regard to the advice of the IAA in respect of Trim Airfield and Irish Balloon Fights, and to the large area over which balloon flights occur in the area, it is considered that the proposed development would not pose an unacceptable risk to flights arriving and departing from the airfield at Trim or to balloon flights taking place in the vicinity of Trim. No significant impacts are predicted for Medivac operations in Ireland given the operation of the current service within the existing extensive network of overhead power lines.

5.16. Material Assets – Traffic

5.16.1. Environmental Impact Statement

The impacts of the proposed development on traffic, are dealt with in Chapter 13 of Volumes 3C and 3D of the EIS. The Chapter includes an assessment of existing road infrastructure in the study area and the identification and assessment of potential impacts. Once operational, the development will be unmanned and traffic generated during this phase will be minimal. The EIS, therefore, focuses on the construction phase of the development.

Construction of the proposed development will take place in multiple isolated areas along the route e.g. tower locations, guarding positions and stringing locations, with the use of temporary accesses from the public road network to construct the development. A temporary construction materials storage yard in Carrickmacross will be used to store materials for distribution to individual sites.

The traffic movements which are predicted to be generated by each tower are set out in Appendix 13.1 of Volumes 3C and 3D and are summarised in Table 13.5 of the EIS (Vol. 3C and 3D). The traffic movements are based on the construction methodology proposed for towers, with the best case assuming that excavated material remains on site and the worst case, that it is removed from the site to an appropriate facility.

For the CMSA, the impact of the traffic generated by the construction phase of the development (peak flows) is indicated in Table 13.6 of the EIS. Some predicted increase in traffic flows are quite high (e.g. 70.8% on L7503). However, these are considered to reflect the low number of vehicles generally using the roads. Furthermore, they represent peak periods and will occur for short periods. For the L-4700 to N2 Link road at the construction materials storage yard, the percentage increase in flows from existing is 111.1%. These flows are considered to represent a worst case scenario which would be unlikely to happen in practice and would be of a short duration. An assessment of the access to the materials storage yard and junctions between it and the N2 indicate that all junctions would operate within capacity throughout the construction period.

For the MSA, the impact of the traffic generated by the construction phase of the development (peak flows) is indicated in Table 13.6 of the EIS (Volume 3D). Again some percentage increases are quite high but these are also considered to reflect the low number of vehicles generally using the roads. The EIS acknowledges that traffic will increase for the short duration of the project but considers that this can be accommodated within the carrying capacity of the road network.

Mitigation measures include:

- Preparation of a detailed Construction Traffic Management Plan (CTMP) prior to the commencement of construction, based on the outline CTMP submitted with the application for approval.
- Preparation of a construction programme to manage traffic levels on local roads and to take account of potential local authority road repair works.
- Survey of road condition prior to and post construction.
- Deployment of traffic management measures and flagmen on local roads for traffic management.
- Temporary road closures for the erection and removal of guarding at road crossings, most notably the M3.
- Close communication between the applicant, local authorities and An Garda Síochána during construction.
- Road signs at temporary accesses and the use of permanent flagmen where visibility is restricted.

With the implementation of mitigation measures residual impacts are considered to be minimal.

The traffic impact assessment is supported by the following documents. These are contained in Volumes 3C and 3D of the EIS, unless otherwise stated:

- Road numbers, Figures 13.1 to 13.4.
- Traffic count locations, Figures 13.5 to 13.8.
- Proposed haul roads, Figures 13.9 to 13.13.
- Temporary access routes in Figures 13.14 to 13.17.

- Traffic assessment study area, Figure 13.18.
- Indicative corridor for the Leinster Orbital Route, Figure 13.19.
- Traffic estimates per tower, Appendix 13.1.
- Traffic count results, Appendix 13.2.
- Individual tower traffic generation, Appendix 13.3.
- Materials compound traffic calculations, Appendix 13.4 to 13.8.
- An outline Traffic Management Plan (Appendix 7.2, Volume 3B).

5.16.2. Policy Context

5.16.2.1. Monaghan County Development Plan 2013 - 2019

Policies and objectives of the Monaghan County Development Plan 2013 to 2019 seek to:

- Provide for the safe and efficient movement of vehicles and pedestrians in the county (RNO2), and
- Maintain all roads in the county to the appropriate standard (RNO5).

Standards for the creation of new access roads or for the proposed intensification of an existing access road are set out in Section 15.23 of the Plan 'Road Access Standards'.

5.16.2.2. Cavan County Development Plan 2014 – 2020

Similarly, policies and objectives of the Cavan County Development Plan 2014 to 2020 seek to:

- Have a well maintained road network in the County (PIO5),
- Promote road safety, avoid the creation of traffic hazards and to ensure traffic management and safety issues are adequately addressed at pre-planning and planning application stage (PCO10).

Policy PIO12 requires that all new developments are assessed with regard to their impact on the operation of the public road network and to require, where appropriate a Traffic and Transport Assessment in accordance with the NRA Guidelines.

5.16.2.3. Meath County Development Plan 2013-2019

Meath transportation policies and objectives seek to:

- Protect the existing roads infrastructure in the county (TRAN SP 14), and
- Prevent the creation of new or additional traffic hazards (TRAN POL 24).

5.16.3. Issues Raised by Observers During the Course of the Application and During the Oral Hearing

The main issues raised by observers may be summarised as follows:

- Adequacy of traffic impact assessment having regard to limited site investigations.
- Adequacy of local roads to accommodate the development.
- Adequacy of proposed temporary access routes at public road interface.
- Adequacy of proposed temporary access routes to accommodate construction traffic.
- Traffic management.
- Leinster Orbital Route.
- Operational Impacts.

The applicant's response to the issues raised in Chapter 18 of their submission to the Board of the 19th October 2016.

5.16.4. The Oral Hearing

Issues arising in respect of Material Assets (General) were principally addressed in Module 1.16 on the 7th April 2016 (Day 16) of the hearing. Issues were also discussed in Module 1.12 (Planning Authorities), Module 1.8 (Construction) and Module 1.15 (Soils). In addition, numerous individuals and landowners raised concerns, particularly in respect of local haul routes and temporary access routes, in Part 2 of the hearing.

Submissions were made by the following observers in Part 1 of the hearing:

- Esmund Keane, Senior Counsel, NEPPC.

- Michael O'Donnell, Senior Counsel, NEPPC.
- Padraig O'Reilly (NEPPC).
- Nigel Hillis (CMAPC).
- Mary Marron (CMAPC).
- Toirleach Gourley, Senior Executive Planner, Monaghan County Council.
- John McKiernan, Senior Engineer, Roads, Monaghan County Council.

In attendance for EirGrid were:

- Brian Murray, Senior Counsel.
- Jarlath Fitzsimons, Senior Counsel.
- Tom Cannon, Senior Traffic Engineer, TOBIN.
- Robert Arthur, Senior Consultant (Construction), ESBI.
- Damien Grehan, Director, Energy and Environment, TOBIN.

5.16.5. Assessment

5.16.5.1. Adequacy of Traffic Impact Assessment

The observers draw the Board's attention to the absence of walkover survey and ground investigations for the majority of tower sites. They therefore question the robustness of the assessment of foundation size and waste arising from tower sites and therefore the adequacy of the traffic impact assessment.

Survey

As discussed in the Construction section of this report, it is considered that the approach taken by the applicant towards the establishment of ground conditions is, in principal, sufficient to determine foundation design and hence the requirement for the importation of concrete and the disposal of spoil. Robustness of the traffic impact assessment, which is based on the predicted volume of concrete to be imported to tower sites, and the volume of waste to be disposed of, is discussed below.

Predicted Foundation Size/Waste Arising

As discussed in the Construction section of this report, during the oral hearing the applicant clarified the volume of concrete predicted to be required by tower type. This is summarised below.

Summary of Applicant's Submission No. 22 Volume of Concrete per Tower Type.

Tower Type (piling/no piling required)	Volume of Concrete	No. of Towers of this Type
Intermediate tower (no piling)	26m^3	209 towers
Intermediate tower (piling)[92]	68m^3	13 towers
Angle tower, 30º (no piling)	132m^3	31 towers
Angle tower, 30º (piling)[93]	540m^3	1 tower
Angle tower, 60º (no piling)	244m^3	40 towers
Angle tower, 90º (no piling)	264m^3	5 towers

(NB the applicant anticipates that none of the proposed 60º or 90º angle towers require piling).

[92] Intermediate towers 104, 106, 117, 119, 120, 122, 163, 187, 269, 279, 287, 292 and 379.
[93] Angle tower No. 105 (30º).

Predicted Vehicle Trips

The applicant's traffic impact assessment is based on a predicted number of vehicle trips per tower site. These are set out by tower in Appendix 13.3[94] (Vol. 3C and 3D) and summarised below. The TIA assumes a worst case scenario that all waste arising will be discharged off site.

Tower Type	Volume of Concrete	Predicted Trips	Waste Arising	Predicted Trips
Intermediate tower	$48m^3$	12[a]	100 tonnes	10[c]
Angle tower	$364m^3$	92[b]	764 tonnes	76[d]

[a] Based on 6 loads of concrete ($8m^3$ delivery truck, 6 movements in and 6 out).
[b] Based on 46 loads of concrete ($8m^3$ delivery truck, 46 movements in and 6 out).
[c] Based on 5 loads of waste (20 tonne dump truck, 5 movements in and 5 out).
[d] Based on 38 loads of waste (20 tonne dump truck, 38 movements in and 38 out).

From the above it is evident that:

- For the vast majority of intermediate towers i.e. those which do not require piled foundations, the TIA substantially overestimates the number of vehicles movements likely to be generated by the construction of tower foundations.
- For 13 intermediate towers requiring piling, the TIA underestimates the number of vehicles movements likely to be generated (Tower Nos. 104, 106, 117, 119, 120, 122, 163, 187, 269, 279, 287, 292 and 397). However, for these towers, an additional $20m^3$ of concrete would be required and a similar volume of waste would be generated. This would equate to 2-3 loads of concrete i.e. an additional 4 to 6 lorry movements, and an

[94] NB During the hearing, the applicant drew the Board's attention to tower types shown incorrectly in Appendix 13.1 - Tower 116 is a 30˚ angle tower not a 90˚ tower; Tower 118 is a 60˚ angle tower not a 90˚ angle tower; Tower 121 is a 30˚ angle tower not a 60˚ angle tower; Tower 140 is a 30˚ angle tower not an intermediate tower; Tower 401 is a 90˚ angle tower not an intermediate tower.

additional load of waste i.e. an additional 2 dump truck movements. These trips would be spread over a number of days and I do not consider that they would be excessive or give rise to additional significant environmental impacts.

- For most angle towers the volume of material to be excavated/imported has been substantially overestimated. However, for one tower type (30º piled angle tower, Tower 105), the volume of material to be excavated/imported has been underestimated by 176m$^{3.}$ This equates to 22 additional loads of concrete and 9 additional loads of waste i.e. 62 additional vehicle trips (i.e. 31 in and out movements). I note that these vehicle movements will be spread over four days (see Appendix 13.3) and would equate to c.15 additional trips a day. Again, I do not consider this additional number of trips to excessive or likely to give rise to significant environmental effects which have not been predicted.

On the basis of the above analysis, and my review of the other more minor vehicle movements predicted per tower site in Appendix 13.3, I would conclude that the traffic impact assessment is based on generally conservative figures and is adequate for the assessment of environmental effects. Where traffic movements have been underestimated, additional movements generated are not substantial and are unlikely to give rise to significant environmental effects.

5.16.5.2. Adequacy of Local Roads to Accommodate the Development

The observers draw the Board's attention to:

- The extensive use of the public road network by construction traffic.
- The lack of site specific information on traffic movements arising at each tower site.
- The limited capacity of public roads to accommodate construction traffic.
- Health and safety issues arising with increase in HGV traffic.
- How the applicant intends to control the contractor to ensure the use of intended haul routes.

- The impact of construction traffic on road condition and in particular on roads that are minor and narrow and which are already in need of strengthening.

All three planning authorities, Cavan, Monaghan and Meath sought clarity on how potential damage to local roads would be repaired and mechanisms to ensure that this was achieved (e.g. pre- and post-construction survey, mechanical survey, bond, development contribution).

Impact on the Public Road Network

The proposed development extends over 100km and will require extensive use of the public road network.

Haul roads to be used by construction traffic are indicated in Figures 13.9 to 13.13 (Vol. 3C and 3D) of the EIS, with national and regional roads providing the 'backbone' of the proposed routes to tower sites. Traffic predicted to be generated by each tower site is set out in Appendix 13.1 and 13.3 (Vol. 3C and 3D) of the EIS (Traffic Estimates per Tower and Individual Tower Traffic Generation). Traffic anticipated to be generated by the extension of Woodland sub-station, the materials storage yard and at guarding locations is set out in Section 13.5.2 (Vol. 3C and 3D). Traffic volumes predicted for each national, regional and local road are shown in Tables 13.6 (Volumes 3C and 3D).

For the national and regional road network, predicted traffic volumes are relatively small, compared to existing traffic flows and can be easily accommodated within the network, adding little to overall traffic flows.

In contrast, as stated in the EIS, some increases in traffic on local roads are substantial (Table 13.6, Vol. 3C and 3D). This arises primarily due to the very low volume of existing traffic using some of the local roads relative to the volume of traffic predicted to be generated by the development. Whilst the predicted increase in traffic on minor roads will be significant locally, the number of vehicle

trips anticipated to be generated by the development is not of itself substantial. Further, impacts will occur at any one location for a relatively short duration given the phased nature of the construction project. For example:

- In total, for the construction of an intermediate tower, 164 vehicle movements are predicted to arise for all 5 stages of construction (worst case scenario), with peak daily movements of 17 vehicles occurring during stringing (which takes place over a week).
- For an angle tower, a total of 340 vehicle movements over the 5 stages of construction, with peak daily flows of 46 vehicle movements occurring during construction of tower foundations (which takes place over 6 days).

I note that the applicant's mitigation measures, as set out in Section 13.6 (Vol. 3C and 3D) of the EIS and in the outline Traffic Management Plan (Appendix 7.1, Vol. 3B), include the following:

- In conjunction with the relevant local authority, provide appropriate signage in respect of the proposed works.
- Programme works to minimise the build-up of traffic on the road network and to minimise impacts on sensitive receptors.
- Manage construction traffic speeds.
- Maintain the public road in a clean condition
- Ensure close communication with the relevant local authorities and emergency services throughout construction.

In addition, at the oral hearing, the applicant emphasised the commitment to construct only one tower at any one time on single carriageway roads (and single lane roads providing access to other minor roads, which themselves provide access to tower sites).

Section 4.10 of the outline TMP states that all project staff and material suppliers will be required to adhere to the TMP, with the principal contractor responsible for agreeing and implementing monitoring measures to confirm the effectiveness of the TMP. It also states that compliance will be monitored by the resident engineer on behalf of the applicant.

Having regard to these commitments, the relatively modest volume of construction traffic arising at individual tower sites, the linear nature of the project and the phased nature of the construction works, I consider that the proposed development could, in principle, be accommodated on the local road network without giving rise to significant traffic safety issues. Furthermore, I consider that suitable arrangements are proposed which allow for the control of the contractor and adherence to proposed mitigation measures.

Road Condition

Having regard to the use of public roads by HGV's it is also possible that construction traffic will adversely impact on the condition of the public road, particularly some of the minor roads within the three counties. In this regard I note that the applicant proposes (Section 13.6.1.2, Vol. 3C and 3D) to undertake:

- A pre-construction video survey of the road wearing course, the appearance and condition of boundary treatments and the condition of any overhead services that will be crossed.
- Visual inspections and photographic surveys of bridges and culverts.
- Where requested by a local authority, pavement condition survey of roads.
- Upon completion of construction, repeat of the pre-construction survey.
- Repair of damage attributable to construction traffic associated with the development.

The approach put forward by the applicant seems reasonable and consistent with good practice and could be controlled by provision of a bond by the applicant in advance of works. (Some of the planning authorities sought a full mechanical road survey, however, given the relatively low volume of HGVs on minor roads and the above survey work I do not consider that this is necessary).

I note Monaghan County Council's request to the Board that the pre-construction survey of road condition should be carried out three months in advance of works and the applicant's agreement to this timescale. This matter could be controlled by condition.

In response to the application for approval, Cavan County Council request the Board to impose a special development contribution in respect of damage to roads as a consequence of the development. However, the provisions of Section 48 of the Planning and Development Act 2000 (as amended) only apply to development granted permission under Section 34 of the Act and are therefore not relevant to this application brought forward under Section 182A of the Act.

5.16.5.3. Adequacy of Proposed Temporary Access Routes at Public Road Interface

The observers raise issues regarding the adequacy of proposed temporary access routes at the entrance to the public road. For example, they argue that adequate sightlines cannot be achieved or would require the removal of hedgerows. Monaghan County Councils raise concerns regarding the capacity of the local road network to safely accommodate off-site, off-loading (in particular to meet standards set out in Guidance for the Control and Management of Traffic at Road Works, DoT, 2010) and the possibility, therefore, of road closures.

Proposed Access Points to and from the Public Road

Access points to and from the public road network for the proposed temporary access routes are shown in:

- Figures 1 to 34 (Vol. 3B) Line Route Key Map Constraints and Ancillary Works.
- Figures 13.14 to 13.17 (Vol. 3C and 3D) Temporary Access Routes.

Furthermore, during the oral hearing, the applicant tabled a series of amendments to proposed access routes and access points at the public road interface (submission Nos. 1, 8, 9, 42, 50, 51, 56 to 61).

Typically entrances are via existing gateways, lanes from the public road or via private access lanes to property or farms. During the oral hearing, the applicant stated that only limited trimming of hedgerows would be carried out, if required, to facilitate access and typically agricultural scale machinery would be used to

construct the proposed development, with this 'scaled down' to suit the width of the proposed access route. No alterations would be made to arrangements for surface water discharge at proposed entrances.

As stated in Section 13.6.1.5 (Vol. 3C and 3D) of the EIS, the applicant proposes:

- Appropriate road signage to be erected to provide warning of temporary access locations to construction sites and,
- Having regard to the limited sightlines in place at some of the proposed access points, a system of permanent flagmen for the control of traffic during all access/egress operations at each site location.

In response to the observations made, the applicant also states that the appointed contractor will be required to confirm details in the Traffic Management Plan of access/egress arrangements for each site (Section 18.1.1 of response document).

I do accept that many of the temporary access routes are minor agricultural lanes and have inadequate sightlines at the point of access on the public road. However, having regard to the limited duration of the construction phase of the development, the relatively modest traffic movements predicted and the proposals for mitigation outlined above, I consider that the proposed temporary arrangements can provide for safe access and egress from construction sites.

Off Site Off-Loading

During the oral hearing, Mr Cannon, for the applicant stated that for the majority of tower sites, off-loading of concrete and steel would take place off the public road within the access gates or lanes of the access routes (examples of typical access points were illustrated on Day 16 of the hearing in respect of accesses to Towers 145, 170, 209, 259, 306, 318, 328).

However, he acknowledged that for a small number of accesses with narrow entrance points (9 in the CMSA and 3 in the MSA) it may be difficult for the delivery vehicles, typically a concrete lorry or flat-bed lorry carrying steel

members, to turn into the site. In these circumstances the applicant proposes off-loading on the public road or, in a small number of cases, the temporary closure of roads. Information was submitted by Mr Cannon of the following:

- Off-loading on the public road - For Tower Nos. 109, 110, 137, 174 and 203, the applicant proposes to park delivery vehicles in the bell mouth junction of nearby public roads or in informal laybys alongside the public road (see applicant's submission No. 24 to hearing). Materials would be off-loaded from these parked vehicles to either a small dumper (concrete) or tractor and trailer (steel) for movement of materials to the tower site. Traffic management would include flagmen to direct traffic around the parked vehicle. (The applicant's submission No. 69 to the hearing provides autotrack information demonstrating how a vehicle could pass the parked up delivery vehicle). By way of example, the applicant estimates that, for Tower 109, discharge of concrete from a lorry with a capacity of $8m^3$ would take approximately 45 minutes[95].
- Short term road closures - For two towers, Tower No. 210 and 211, the applicant stated that a short term road closure may be required to facilitate delivery of concrete/steel, for example, with 3 short term road closures over two days[96].

Having regard to the above, I would point out to the Board:

- The temporary off-loading of material on the public road is likely to cause short term delays for road traffic. I note from the material presented by the applicant in submission Nos. 24 and 69 that there would appear to be inadequate space on the public road to accommodate the parked vehicle, the vehicle into which material is being unloaded and passing traffic. It may therefore in effect give rise to temporary road closures.

[95] Based on dumper truck with a capacity of $1.5m^3$ to $1.6\ m^3$ in a dumper truck, requiring 5 trips of the dumper truck to discharge all of the concrete in an $8m^3$ concrete lorry.
[96] The applicant also stated that in practice it may also be possible for the contractor to use smaller delivery vehicles, such as a $6m^3$ lorry or with the permission of the landowner, use a nearby private wide bell mouth, to avoid off-loading on the public road and/or road closures

- The length of time the parked up vehicle will be in place will be dependent on the distance of the tower site from the off-loading area and the duration of impact has not been fully articulated for all sites.

Whilst I would accept that the above arrangements may give rise to inconvenience to some road users, the proposed construction works occur over a very short duration and these impacts would occur for a small number of towers sites. I would consider therefore that the issue could be dealt with by condition i.e. requiring the applicant to furnish the relevant planning authority, for agreement, details of off-loading arrangements for tower sites.

5.16.5.4. Adequacy of Proposed Temporary Access Routes to Accommodate Construction Traffic and Impact of Development on Same

As discussed the Construction section of this report, the observers draw the Board's attention to:

- The minor nature of some of the proposed access routes and their unsuitability for use by construction traffic.
- The impact of the use of the proposed access routes on sensitive receptors, notably proximity to residential property, impacts on privacy and safety risk to children.

Use of Temporary Access Routes by Construction Traffic

As stated, the applicant is not seeking approval for use of the temporary access routes. These are presented to enable environmental impact assessment of the proposed development. Whilst environmental impacts are discussed under each environmental topic of this report, it is considered that the applicant has generally demonstrated that a viable access is available to each construction site, guarding location and stringing area.

Of note, it is considered that the applicant has demonstrated:

- Means to overcome minor access routes, including scaling down equipment to match width and nature of the access route.
- Means to protected inadequate ground conditions, for example, with the use of proprietary matting, temporary bridges, and low pressure vehicles.
- Where necessary, the identification of alternative access routes where landowners have identified impediments.

Having regard to the location of the proposed development on almost wholly agricultural land, the approach taken appears therefore in principle to be both practical and technically feasible.

Notwithstanding this general conclusion, I draw the Board's attention to the applicant's approach towards scaling down equipment. During the oral hearing, the applicant indicated that concrete may be transferred to tracked machinery for transport along temporary access routes to c.35 tower construction sites[97]. The reduction in equipment size is likely to result in an increase in vehicle movements on temporary access lanes. For example, if concrete is transferred from a lorry with a capacity to $8m^3$ to a wheeled or tracked dumper truck with a capacity of $1.6m^3$, this would result in 10 dumper truck trips (to and from the concrete lorry). For tower 118, a 60º angle tower, with an anticipated requirement for $244m^3$ concrete, this could equate to c. 152 tipper truck loads over 3 to 4 days ($244m^3/1.6m^3 = 152$).

Vehicle movements arising from scaling down equipment may therefore increase the risk of damage to existing laneways and agricultural land, intensify impacts on sensitive receptors (if present) and interfere with the day to day management of agricultural land and working farmyards.

[97] In the course of the oral hearing, the applicant indicated that concrete may be transferred to tracked machinery for transport along temporary access routes to the following tower construction sites: 104, 107, 108, 109, 110, 118, 119, 120, 128, 129, 137, 139, 146, 159, 166, 172, 173, 174, 175, 176, 184, 186, 203, 210, 211, 228, 234, 260, 268, 331, 332, 333, 334, 349 and 357.

As discussed in the Construction section of this report, the applicant proposes a range of mitigation measures to minimise damage to land (and compensation in the case of damage arising) and impacts on sensitive receptors. Further, in Land Use section of this report, mitigation measures to minimise impacts on working farms are referred to.

In principle, I consider that these measures could equally address any additional impacts arising from stepping down vehicle size, but that this matter should be specifically addressed by condition (requiring details of 'step down' arrangements to be submitted to the relevant planning authority for agreement).

Impacts on Sensitive Receptors

With regard to potential impacts on sensitive receptors, I note that the outline Traffic Management Plan includes measures to minimise impacts on sensitive receptors. These include, adherence to speed limit restricted speeds in sensitive locations (30km/hr) and maintenance of local roads in a clean condition. In addition, and importantly, the applicant has stated that a 'dedicated observer' would be stationed in all sensitive locations (e.g. schools, residential development, farm yards) to ensure the safe movement of HGVs.

Whilst I accept that the proposed use of temporary access routes may bring construction activity in close proximity to some sensitive receptors, notably residential property, having regard to the temporary nature of the works and to the applicant's proposed mitigation measures, I consider that the use of the proposed temporary access routes could take place without giving rise to significant impact on these.

5.16.5.5. Traffic Management

The observers argue that an inadequate traffic management plan has been developed in respect of the proposed development.

I note that in pre-application discussions the Board advised the applicant that a fully detailed traffic management plan would not be required at application stage. Consistent with this the applicant includes an Outline Traffic Management Plan in Appendix 7.2, Vol. 3B, of the EIS. The Outline TMP adequately describes the measures to be put in place for the construction of the proposed development and provides a mechanism for the inclusion of any further requirements of the Board. All resultant mitigation measures will be included in the final TMP.

5.16.5.6. Leinster Orbital Route

Transport Infrastructure Ireland (TII) comments that the EIS does not make substantial reference to the Leinster Orbital Route or the interface between the proposed development and the Route. It requests that the Board requires the applicant to:

- Consult with the TII with regard to detailed design in advance of any works
- Provide suitable vertical clearance for a future LOR which may be +7.5m above ground level (between Towers 342 and 354).
- Maintain safety and standards on the national road network throughout construction of the proposed development and that works do not impinge on the M3.

I note that the EIS for the proposed development does refer to the Leinster Orbital Route (Section 13.1 and Figure 13.19, Vol. 3D) and that the Route itself is at an early stage of development (indicative corridor). Between Towers 342 and 354 the proposed development is routed to the east of Dunderry village, south of Robinstown and across the Boyne River, west of Bective Abbey. Any increase in ground clearance of +7.5m could result in quite significant visual impacts in this sensitive landscape. It is considered that in the absence of more definitive information that it would be premature for the Board to give consideration to such a significant additional ground clearance over such a wide corridor.

With regard to maintaining safety and standards on the national road network, I note that (a) the application documentation states that the main contractor will be required to maintain road safety during the installation and removal of guarding for

road and railway crossings (including the M3) and that plans for these works be made available to relevant stakeholders for consideration and approval (Section 4.15, outline TMP, Vol. 3B), and (b) in response to the observation by TII, the applicant has undertaken to meet with the TII, if the proposed development is approved, to agree measures for crossing National Roads and Motorways with the agreed measures to be included in the Tender Documents for the proposed development.

Having regard to the above, I consider that the arrangements for maintaining safety and standards on the national road network are appropriate and acceptable.

5.16.5.7. Operational Impacts

Chapter 7 of Volume 3B of the EIS outlines the limited requirement for access to tower sites over the lifetime of the project. These requirements are not substantial or likely to impact on road infrastructure or traffic safety during the operational phase of the project.

5.16.6. Summary and Conclusion

Key issues for this topic relate to:

- The adequacy of the TIA.
- The adequacy of the local road network and the proposed temporary access routes to accommodate the development.

Having regard to the generally conservative nature of the assumptions underlying the TIA, it is considered that the impact assessment is robust and sufficient to predict environmental effects. Where traffic movements have been underestimated, additional movements generated are not substantial and unlikely to give rise to significant environmental effects.

Having regard to the linear nature of the proposed development, construction works at discrete and separate sites, the phased approach towards construction, and subject to implementation of the proposed mitigation measures, it is

considered that the proposed development can be accommodated within the public road network, without undue impact on its condition or traffic safety.

Issues arising in respect of off-loading on the public road, in the small number of instances where this arises, can be adequately dealt with by condition.

Having regard to the applicant's proposals to:

- Manage traffic movements at the interface of the temporary access routes and the public road,
- To overcome the minor and narrow nature of some of the temporary access routes,
- Mitigate impacts on the ground conditions, sensitive receptors and farming practices,

It is considered that the proposed temporary access routes are adequate to accommodate the proposed development and can be utilised without giving rise to significant impacts on condition of the access route, sensitive receptors or farm practices.

Issues arising in respect of stepping down construction equipment can be dealt with by condition.

5.17. Cultural Heritage

5.17.1. Environmental Impact Statement

Chapter 14 of the EIS (Volumes 3C and 3D) describes and evaluates the impact of the proposed development on the archaeological, architectural and cultural heritage in the vicinity of the proposed development. Details of features of archaeological and architectural interest along the line of the route and relative to the tower positions in each study area are displayed in the following drawings: -

- Fig 14.1-14.13 CMSA Volume 3C (Figures.)
- Fig 14.1-14.19 MSA Volume 3D (Figures).

Further details are provided in Appendix 14.1-14.5 of Volume 3C and 3D (Appendices)

In terms of the archaeological resource, the EIS considers in detail an area within approximately 2km on either side of the proposed alignment. It also has regard to National Monuments in State Care within 5 km and notable sites of national importance or significance at greater distances.

The proposed route passes through three counties each of which possesses a rich archaeological resource. The recorded monuments/sites are afforded universal protection under the National Monuments Acts 1930-2004. A lesser number of monuments are accorded a higher level of protection i.e. they are deemed to be of National significance and are described as National Monuments. There are also sites, which are considered to be of outstanding international importance to warrant special protection. These World Heritage Sites, which are recognised as places of special cultural or physical significance, are listed by UNESCO.

With regard to architectural heritage, all structures listed in the Record of Protected Structures (RPS) and included in the National Inventory of Architectural Heritage (NIAH) within 2 km of the proposed development are considered in the EIS. Structures deemed to be of National Importance in the RPS or the NIAH as well as Architectural Conservation Areas (ACA) within 5km are also included

(Appendix 14.3 Volume 3C & 3D Appendices). Demesne Landscapes and Historic Gardens (NIAH Garden Survey) within 2 km of the alignment area and sites of other cultural importance within the wider locality are also identified.

Both the construction and operational stages of the development have the potential to impact on the archaeological, architectural and cultural resource. There is potential for direct physical impact on both existing recorded monuments/sites and on previously unrecorded sites arising from construction activity. These activities include the construction of foundations for each tower, provision of temporary access routes for tower construction, stringing operations associated with the installation of conductors, the setting up of guarding stations and the replacement of the intermediate polesets associated with the crossing of existing 110 kV OHL.

The operational stage has the potential to impact on the setting of sites and monuments, protected structures, demesne landscapes and sites of cultural interest.

5.17.2. Policy Context

Policies and objectives for the protection and preservation of architectural and archaeological heritage are contained in the development plans for the three counties.

5.17.2.1. Monaghan County Development Plan 2013-2019.

Policies and objectives regarding the protection of Architectural and Built Heritage and Archaeological Heritage within Co. Monaghan are contained in section 4.11 and section 4.12 of the plan. Of particular note are the following:

- Architecture and Built Heritage – (Objectives (ABO 1 and ABO 4),
- Protection of Protected Structures - (Objective PSO 1 and Policies PSP 2 and PSP 4),
- Protection of Archaeological Heritage - (Objectives AHO 1, AHO 2 and Policies AHP1-AHP 8).

Relevant appendices include the following: -

- Appendix 5 – Record of Protected Structures
- Appendix 6 – Record of Protected Monuments

5.17.2.2. Cavan County Development Plan 2014-2020

Chapter 7 of the Plan is devoted to Built Heritage and Archaeology. It seeks to protect, preserve and enhance the architectural and archaeological heritage of the County.

Relevant policies and objectives include;

- Protected Structures - (Policy BHP 1 and Objective BHO5);
- Protection of Archaeological Heritage - Policies BHP 5 and BHP 8 and Objectives BHO 17, 18, 19, 20, 22).

Relevant appendices include the following: -

- List of Protected Structures (Appendix 1)

5.17.2.3. Meath County Development Plan 2013-2019.

Cultural Heritage is addressed in Section 9.6 of the Plan. It is the aim of Meath County Council to protect, conserve and enhance buildings, structures, sites and features of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Relevant policies and Objectives include;

- World Heritage Site (Policy CH POL1 and Objectives CH OBJ 1, CH OBJ 2 CH OBJ 3)
- World Heritage Sites on UNESCO Tentative list (Policy CH POL 5)
- Archaeological Heritage - (Policies CH POL 7, CH POL 8 and Objectives CH OBJ 7 and CH OBJ 8)
- Architectural Heritage – (Policies CH POL10 and CH POL11 and Objective CH OBJ 13).

- Architectural Conservation Areas – (Policy CH POL 18 and Objective CH OBJ 21).
- Designed Landscapes, Historic Parks, Gardens and Demesnes (Policy CH POL 19 and Objectives CH OBJ 22 and CH OBJ 23)

Relevant appendices include the following: -

- Appendix 08 –Record of Protected Structures
- Appendix 09 –Architectural Conservation Areas
- Appendix 10 – UNESCO World Heritage Site
- Appendix 11 – Nat. Monuments in State Care & Register of Historic Monument.

Gaeltacht

RD Policy 28 of the Meath County Development Plan seeks to ensure that all new development in the Gaeltachts' have a positive impact upon use of Irish in the area, whilst seeking to realise their economic and development potential in a balanced and sustainable manner over the lifetime of the plan.

5.17.3. Issues raised by observers during the course of the application and during the oral hearing.

Issues surrounding the impact of the development on the cultural resource of the area have been raised in a large number of submissions. The issues raised are summarised as follows: -

- Impacts on World Heritage Sites.
- Impacts on Monuments in State Care.
- Impacts on recorded archaeological monuments/sites of archaeological potential.
- Impacts on Teltown ZAA.
- Impacts on specific archaeological sites.
- Impacts on protected structures /NIAH sites.
- Impacts of landscape demesnes and historic gardens.

- Impacts on other places of cultural significance/Meath Gaeltacht.
- Failure of EirGrid to properly assess the impacts of the development on the cultural heritage of the area.
- Development will devalue heritage assets.
- Development not in compliance with the heritage policies of Monaghan County Development Plan.
- Other matters.

The applicant's response to the issues raised in the submissions to the Board on Cultural Heritage is contained in Chapter 19 and Appendix 19.1 of EirGrid's submission dated October 19th, 2015.

5.17.4. Oral Hearing

Impacts on the Archaeological, Architectural and Cultural environment were discussed in Module 1.13 (Cultural Heritage) on 31st March 2016 (Day 13 of the hearing).

Submissions were made by the following Observers in Part I of the hearing: -

- Dr Frederick O' Dwyer (Department of the Arts, Heritage & the Gaeltacht.
- Ms Shirley Clerkin (County Heritage Officer, Monaghan Co Council).
- Mr Toirleach Gourley (Senior Executive Planner, Monaghan Co Council).
- Ms Loreta Guinan (Heritage Officer, Meath County Council).
- Ms Jill Chadwick (Architectural Conservation Officer, Meath Co Council).
- Mr John Clancy (Meath Archaeological & Historical Society).

During Part 2 of the oral hearing various site-specific matters were raised by individuals and groups.

In attendance for EirGrid were: -

- Mr Stephen Dodd (Junior Counsel).
- Mr Declan Moore (Principal Archaeologist, Moore Group).
- Mr Joerg Schulze (Senior Landscape Architect AECOM).
- Mr Robert Arthur (Senior Consultant, ESBI).

- Mr Shane Brennan (Project Engineer, EirGrid).
- Mr Damien Grehan (Director of Energy & Environment, TOBIN).

5.17.5. Assessment

The following provides an assessment of the various issues raised in the submissions and during the oral hearing.

5.17.5.1. Impacts on World Heritage Sites

Issues were raised in the submissions regarding the impact of the development on Bru N Boinne World Heritage Site and two candidate sites in Co Meath.

The Bru Na Boinne site in Co. Meath is one of two UNESCO World Heritage Sites in Ireland. It is a megalithic site located on the northern banks of the Boyne River Valley, which is dominated by the three great burial grounds of Knowth, Newgrange and Dowth.

There are also two sites in Co. Meath which have been included in the Tentative List for world heritage status. These include the Tara Complex nominated as part of the 'Royal Sites of Ireland' assemblage and the monastic site of Kells listed as part of the group of 'Early Medieval Monastic Sites'.

There will be no impacts arising from the development on Bru Na Boinne, which is located 15 km from the alignment. The two candidate sites are also well removed from the proposed development and will not be impacted. The Tara Complex is located 6.3 km to the east of Towers 350 to 360 and the monastic site of Kells is located approximately 7km to the west of Towers 295 and 305. Both sites, which are also national monuments are discussed in more detail below.

5.17.5.2. Impacts on Monuments in State Care

There will be no direct physical impacts arising from the proposed development on any monument in the Ownership or Guardianship of the State.

The Department of Arts Heritage and the Gaeltacht (DAHG) raised issues regarding the lack of consideration of visual impacts on the setting of a number of monuments in State care including the Hill of Tara, Bective Abbey and reference is also made to the ancient landscape of Teltown. The DAHG considers that the future amenity value of these sites has not been considered and that further information is required on the extent of impacts on individual monuments/complexes. The DAHG also refer to the proximity of the line to cropmarks to the west of Tara, which are not mentioned or identified in the EIS. Other submissions refer to impacts on the monastic site of Kells, Trim Castle, Cruicetown Church and Cross, Dunsany Church and sites in Roberstown and Nobber.

Each of the monuments are described and evaluated below in terms of potential impacts for the information of the Board.

Hill of Tara (National Monument No 676 &148)

The Hill of Tara is the most important archaeological heritage site in the vicinity of the development. It lies in an elevated position from which there are panoramic views over the surrounding lowlands. The site is of international interest and is a major tourist attraction. Views from the site are designated of national importance in the Meath Co Development Plan (Viewpoint 44).

The DAHG referred to the limited visual assessment and requested that views from other locations on the Hill Of Tara be considered and assessed. Ms Guinan, Heritage Officer (Meath County Council) considered that the assessment of impacts on Tara needs to be carried out by an independent world heritage expert, with specific experience in assessing world heritage sites. She considered that such an expert could advise on the impacts of the development alone or in combination with other large scale infrastructural development. Concerns were also expressed by Ms. Guinan on potential cumulative impacts with the proposed Maighne Wind Farm.

Photomontage 68 provides a panoramic view from one of the most elevated parts of the Hill of Tara site looking west, south west. There is an existing 220 kV power line running at 1.25km distance between the Hill of Tara and the proposed development. This line is barely discernible in this view shed. The proposed alignment will be routed a considerable distance further away i.e. in excess of 6km from the Hill Of Tara. The towers will be seen entirely against the land and will not be visible above the skyline. Views will be obscured by distance and the complexity of the receiving environment, with its patchwork of fields, extensive areas of hedgerows/trees and man-made structures. Whilst the development will have a large spatial extent in this view shed, it will have no significant impact on views from this important heritage site.

It was confirmed by EirGrid that the complex of previously unrecorded sites (cropmarks) referred to by the DAHG is identified both in the EIS and in the Partial Undergrounding Report. Archaeological monitoring is recommended for Tower 352, which is the nearest tower to the cropmarks at 250m.

Mr Clancy (Meath Archaeological and Historical Society) raised issues regarding the quality of photomontages and questioned why LiDAR surveys, similar to those requested by the Inspector during the N2 road oral hearing were not carried out. In response, Mr Schulze noted that while LiDAR assessments are useful, particularly in determining impacts at closer ranges, given the distance involved no additional information would be provided.

Based on my inspection of the site, the information presented in the EIS and the evidence presented at the oral hearing, I am satisfied that the proposed development will not impact significantly on the setting of the Hill of Tara. I am satisfied that Photomontage 68, (and the additional photomontage submitted to the oral hearing - Submission 13.C) which were taken from the most elevated parts of the site are adequate for assessment purposes. I am also satisfied that the proposed development will not detract from the cultural significance or visual amenity of this important heritage site or prejudice its future tourist potential. I am

not, therefore, persuaded that the engagement of independent expert opinion by the Board is warranted.

Kells (National Monument 108 & 158)

The monastic site of Kells is also included on the Tentative list of UNESCO's World Heritage sites. It includes a number of National Monuments including St. Columb's House and the Round Tower and High Crosses, located within the town. The proposed interconnector will run c.6 km to the east. Having regard to the built urban context in which the monuments are located and the distance to the proposed alignment, I accept that the potential for impacts is negligible. The cultural significance, amenity and tourist potential of the site will not therefore be compromised.

Bective Abbey (National Monument No. 187)

Bective Abbey is a former Cistercian Abbey located to the north of the River Boyne and immediately east of local road L4010. The abbey includes features such as a nave, cloister and a fortified tower. It has an enclosing wall to the west, south and east with a gated entrance to the south. It is a popular tourist attraction. There are unobstructed views towards the abbey from the site entrance/ pathway and the local road incorporating Bective Bridge. The proposed development will not be visible in these viewsheds and accordingly there will be no impact on the setting of the abbey itself when viewed from these locations.

The alignment will run to the southwest of the abbey on lands on the opposite side of the road. From most parts of the abbey there will be no impacts. The cloister is enclosed and views from the nave, which are to the north and east will not be impacted. Impacts will occur on views from the south as a number of towers come into view (Photomontage No 65). I accept that the photomontage, which was taken from the top of the stairs on the south elevation displays the greatest potential impact (worst case scenario) due to its elevated position at c. 2m above surrounding ground level.

This section of the alignment will cross gently undulating land at a higher elevation. It will cross a working landscape punctuated by buildings and vegetation. The closest tower will be at c 950m (Tower 356). I accept that the sensitivity of the site to impacts on setting is very high, but that the main views from the abbey tend to be towards the picturesque setting of Bective Bridge, and not across agricultural farmland to the southwest. This being said, the presence of the towers and associated OHL will impact on the setting of the monument from the south. However, I do not consider that this impact will degrade or detract from the cultural significance of the site or prejudice its future amenity value or tourist potential.

Trim Castle (National Monument No 514)

The Anglo-Norman castle, which dates back to the 12th century, occupies a commanding position on the south bank of the River Boyne in Trim, Co Meath. There are also a number of other national monuments in the town including the Cathedral of St. Peter and Paul, St John's Priory etc.

Photomontage 71 encapsulates the views from the top of the castle eastwards towards the proposed development. The alignment will run 5.6 km from the castle in an occupied and vegetated landscape. The top of the castle provides the most elevated view platform of all the monuments in the town. The towers will be seen entirely against the land and will be not be clearly recognisable in the distance. I am satisfied that there will be no significant adverse impacts arising from the development on the setting of the castle or other national monuments within the town, which would prejudice their cultural significance or future tourist or amenity potential.

Cruicetown Church and Cross (National Monument No.264)

Cruicetown Church (in ruins) and Cross are located in the middle of a large agricultural field c.1.7km to the west of the alignment. The monument occupies an elevated position, is unscreened and is accessible to the public. There are

unobstructed views from the site in all directions. Photomontage No. 47A illustrates the views from the adjacent Motte, an elevated earthwork located to the north east of the church.

I accept that the impact on the setting of Cruicetown Church and Cross will be limited. Views towards the alignment, which will be located on lower ground are curtailed by a low ridge and intervening vegetation. The proposed development will not, therefore, impact on the attractiveness of the site as an area of archaeological and cultural significance.

Dunsany Church (National Monument No 489)

Dunsany Church is located within the grounds of Dunsany Castle (ACA) and in excess of 4km to the northeast of the proposed alignment. It is screened by mature planting and there will be no impact on the monument or its setting arising from the proposed development.

Robertstown Castle –Motte & Robertstown Ringfort

Roberstown lies to the west of the alignment and contains two national monuments. The Robertstown Caste –Motte (National Monument No 256) is located in open countryside c 2.8km to the west of the alignment. Due to the presence of intervening ridges between the site and the proposed development, there will be no impacts on its setting. Robertstown Ringfort (National Monument No 542) is located to the south of the castle-motte. It is located in agricultural land and is not visible from the surrounding road network. At a distance of c. 3.6 km from the alignment will not be significantly impacted by the development.

Nobber

The sites referred to at Nobber include a church, graveyard and grave slabs, (SMR's ME005-071001-071016) and a medieval settlement cluster and motte and bailey. The alignment will run c. 1.75km to the west of Nobber. Views from the village will be curtailed by the existing built form, the significant separation

distance, intervening ridgelines and mature treelines and forestry adjacent to the Brittas estate. There will be no direct impacts on any of the sites or their setting within the settlement. The Motte and Bailey (SMR ME005-071 &070) lie to the northwest of the town and are prominent and visible from the R162. Due to the separation distance, there will be no direct impacts on the monuments and no significant impacts on their setting arising from the proposed development.

Significant restoration work has been carried out on the former Church of Ireland and adjacent graveyard in the town. It is now home to the George Eoghan Cultural Heritage Centre and concerns were raised during the oral hearing regarding impacts from a window in the west elevation that will form a viewing platform. The church and graveyard occupies a more exposed location, but having regard to distance, intervening topography and vegetation, views towards the alignment from this location will not be significant. There will be no significant impacts on the setting of the site or its potential as a cultural/visitor centre.

5.17.5.3. Impacts on recorded archaeological monuments and areas of archaeological potential

Both the construction and operational stages of the development have the potential to impact on the archaeological resource. Construction activity has the potential to result in direct physical impacts and the operational stage has the potential to impact on the setting of sites and monuments.

The archaeological heritage input into the constraints study identified all recorded monuments within the study area. A total of 558 monuments were identified within 2km of the centreline of the proposed development. Mitigation has been achieved by avoidance and there will be no direct physical impacts on upstanding remains of any previously recorded archaeological sites within the study areas

However, it is acknowledged in the EIS that the potential exists during construction for direct physical impacts to occur on known and previously unrecorded monuments/sites or features. These impacts could arise during construction of foundations, stringing works, access routes and from construction traffic passing in

close proximity to the sites. None of these activities will result in damage to visible or upstanding features but may affect sub surface deposits associated with the monuments. The EIS identifies 8 No. recorded monuments in the CMSA and 7 No. in the MSA which could be impacted due the proximity of works.

The EIS also identifies other tower locations (9 no. in the CMSA and 15 no. in the MSA), where there will be no direct impacts on a specific monument but where there is the potential to encounter archaeological deposits due to the sensitivity of the surrounding area (i.e. due to the presence of several monuments in the vicinity). Locations where the potential exists for excavation works associated with guarding stations, and their access tracks to encounter previously unrecorded archaeological deposits (due to proximity to monuments/features identified on historic mapping etc.) are also identified.

Potential impacts may also arise in locations where the proposed alignment crosses existing transmission lines. Within the CMSA the proposed 400kV OHL will cross the existing Louth-Rathrussan 110kV OHL between Towers 180 and 181. This will require the replacement of two polsets, one of which will be located less than 20m from an enclosure (SMR No – MO027-077). Within the MSA the line will cross the Arva-Navan 110 kV OHL between Towers 307 and 308 which will also require the replacement of two existing polesets. The works will be located within the Teltown ZAA. There are no known archaeological monuments in the vicinity but the area has high archaeological potential. Groundworks associated with the replacement of the polesets have the potential to impact on archaeological deposits associated with the recorded monument in the CMSA and with the archaeological potential of Teltown ZAA in the MSA.

In order to avoid direct physical impacts on recorded monuments in close proximity to the alignment during construction standard best practice measures will be adopted. This will include the establishment of a buffer (demarcation) around the outer perimeter of the site to prevent accidental damage from construction traffic and other impacts. A suitably qualified archaeologist will be employed to confirm the access to the site, carry out pre-construction archaeological testing/monitoring on the site, as appropriate. In areas of high

archaeological potential, construction activity will be carried out under the supervision of the project archaeologist and monitoring /testing carried out as appropriate. All groundworks associated with the replacement of polsets to the existing 110 kV transmission network in both study areas will also be monitored by a qualified archaeologist. Where archaeological deposits are discovered there will be dealt with in consultation with the requirements of the DAHG.

The mitigation measures proposed are in line with the Code of Practice which has been adopted between the National Monuments Service of the DoEHLG and EirGrid (2009). It outlines the principles to be applied for the protection of the archaeological resource during the development of the transmission network. Subject to the implementation of these best practice measures, I accept that potential impacts on the archaeological resource will be minimised.

Once constructed the proposed development has the capacity to impact on the setting of archaeological monuments due to its extended linear nature and large vertical components. The EIS identifies 15 no. sites within the CMSA and 25 no. sites within the MSA where it is considered that there will be a moderate/significant permanent negative impact on setting i.e. 7% of the total number of recorded monuments/sites proximate to the line. There are no measures to mitigate such impacts. None of these monuments are national monuments. They are generally overgrown or otherwise neglected and are on private lands with no formal public access, all of which limits the potential for impacts on the future amenity of particular sites.

5.17.5.4. Teltown ZAA

Teltown Zone of Archaeological Amenity (ZAA) is located approximately half way between Navan and Kells (Fig. 14.18 Volume 3D Figures) and to the west of Donaghpatrick village. It encompasses an area of around 520 ha and has been identified as an area of high archaeological potential.

Various submissions were made during the course of the oral hearing highlighting the significance of Teltown including those made by Mr Paul Gosling, Galway –

Mayo Institute of Technology (Day 32) and George Eogan, former Professor of Archaeology at University College Dublin (Day 34). These together with other observers refer to the uniqueness of the area and the significance of the landscape historically, with a rich assemblage of sites that date back to the Bronze Age. It was here that the pagan festival of Lughnasa was held annually, a place where people congregated for ancient sporting events, trial marriages and religious ceremonies.

The importance of Teltown is considered to be understated and not properly understood. It is contended by the observers that the emphasis is on individual sites/monuments with a lack of understanding of the relevance of the lesser sites, associations between monuments, their landscape and cultural context. It is argued that the area is possibly as important as Tara and that it should be left in its rural setting with no further development permitted. It is considered that there is potential for previously unknown archaeological sites to be impacted, that many of the sites identified in previous surveys are not protected and the alignment will run through a cluster of monuments to the north and should be relocated.

The proposed development as it passes north to south within the ZAA will include eight lattice towers (Towers 303 - 310) and associated OHL. Although it has no legal status, the area is regarded by the National Monuments Service as an archaeological landscape and of high archaeological potential due to its historic associations with the ancient assembly site of Teltown.

A comprehensive evaluation of the impacts of the development on Teltown ZAA is included in the EIS (Appendix 14.5 Volume 3D Appendices). A review was carried out of all known sites of archaeological, architectural and cultural significance. Primary literary sources were consulted and OS historic mapping aerial and satellite photography were reviewed. A LiDAR survey was commissioned of the area to supplement the body of knowledge. This resulted in two new sites being identified.

Whilst there are a number of recorded monuments in the vicinity of the alignment as it passes through the ZAA none of these will experience direct physical impacts

as a result of the development. The nearest known archaeological site, a rath (SMR No. ME017-32) is located to the south east of Tower 309 at 330m distant. Two potential sites were identified within 120m and 280m of the proposed development. The sites are not publicly accessible, are located on privately owned lands, unserviced by either pedestrian tracks or rights of way.

It is acknowledged in the EIS that this large area is of high archaeological potential and that previously unrecorded archaeological deposits could be impacted during the construction stage. Standard mitigation measures are recommended to ensure these impacts are kept to a minimum. These include archaeological testing, archaeological monitoring and construction techniques that will keep ground disturbance to a minimum. Any archaeological deposits that are discovered during the construction phase will be managed in full consultation with the National Monuments Service of the DAHG.

It is considered in the EIS that the main impacts on the ZAA will arise from the operational stage. The evaluation highlighted five areas of recognised prominence and significance. According to the observer's submissions that there are important associations between the different sites, which include: -

- Rath Dhu (SMR No. ME017-027),
- The Knockhauns (SMR No. ME017-049)
- Domhnach Phadraig (Donaghpatrick)
- Rath Airthir (SMR No. ME017033).
- Teltown Church and Graveyard (SMR No ME 017-031 & 031001)

Rath Dhu

Rath Dhu (enclosure) is located to the west of the alignment at 1.4 km distance (Photomontage No 53 Appendix 14.5 Volume 3D) and apparently was located at the centre of the Teltown festival. Comparisons between original First Edition OS maps and current information suggest that both the site and its context have altered significantly as a result of subdivision of fields, the construction of a laneway and houses in close proximity. The enclosure is located very close to a

house at the end of a cul-de-sac. The intervisibility that once existed between this site and other sites such as the Knockhauns is significantly eroded by houses and other structures including agricultural buildings.

Knockauns

The Knockauns (linear earthwork) which is thought to be associated with Teltown marriages was partially destroyed in 1997. It lies further east and is c 570m west of the alignment. The site is elevated with views of the surrounding area to the south. Two dwellings have been constructed to the east between the site and the proposed alignment. The partial destruction of the monument and the infiltration of development in its vicinity has significantly altered the setting and context of this site.

Donaghpatrick/RathAithir

Donaghpatrick village is located at the southeastern end of the ZAA. It is a picturesque village that is particularly sensitive containing a number of protected structures and archaeological monuments. These include

- Rath Airthir Motte and Bailey (SMR No. ME017033),
- St Patricks Church, Graveyard and associated features (SMR No. ME017-034001-034005, RPS No MH017-131),
- Parochial hall (RPS No MH017-132),
- Stewards house (RPS No. MH017-133) and
- Sextons house (RPS No. MH017-134).

The alignment will run to the west of the village. Views from within the village will be restricted by existing buildings which limits the potential for impacts on the setting of the village and its associated monuments. In wider views from the church graveyard the tops of the towers will be visible along the ridgeline. Whilst I accept that the proposed development will introduce new elements into the landscape, I do not consider it will impact significantly or detract from the setting of the church and graveyard.

It is contended in the submissions that the screening effect of the trees around Rath Aithir and St Patricks Church is exaggerated in the EIS. EirGrid draws attention to the photomontages which were taken during the winter months (No 56 & 57), which demonstrates that this is not the case. Rath Airthir motte and bailey is located 430m from the route of the proposed development and to the southeast of Tower 307. It benefits from dense vegetation which covers the western side of the motte which reduces potential impacts on its setting.

Teltown Church & Graveyard

Teltown Church consists of the ruins of a small church surrounded by a number of gravestones to the east of Teltown House. The site is located 690m west of the alignment and views towards the alignment will be partially obstructed by intervening hedgerows and screening. The existing 110 kV line runs in a west-east direction to the east. Taken in conjunction with the existing 110kV OHL which runs in a west-east direction, I accept that there will be a moderate negative impact on the setting of the church and graveyard, which cannot be mitigated.

Impacts on Teltown ZAA

Whist Teltown ZAA has no legal designation and there is no reference to it in the cultural heritage section of the current Meath Co. Development Plan, it is recognised as an area of archaeological amenity by the DAHG. Whilst I acknowledge the historical and cultural significance of the area, I accept that the impact on setting has to be considered in the context of an occupied landscape with attendant development, infrastructure and existing transmission lines.

The area may once have been as important as Tara, but incremental changes over the years including the subdivision of fields, construction of roads buildings etc., has fundamentally altered this landscape of ancient sites. This has impacted on setting and the associations and intervisibility that once existed between the assembly of sites in the Teltown area. The area does not have an identity that sets

it apart from the surrounding landscape (as in the case of the Hill of Tara) and as noted by Mr Moore (EirGrid) during the oral hearing, it is no longer a cohesive archaeological landscape. Whilst I accept that the impacts on individual monuments will not be significant due to the impact of more recent development, I do accept that running the overhead line supported on large lattice towers will impact on the cultural significance of the area as a whole.

Mr Colm Keyes in his submission to the hearing (Day 13) referred to a refusal of permission for a house (PA Ref No 98/220) issued by Meath County Council on the grounds that the development would conflict with the policy of the planning authority, which seeks to protect and preserve the Zone of Archaeological Amenity for Teltown (Submission 33). He argued that similar restrictions should apply to the proposed development. I would point out to the Board that there is no reference to Teltown ZAA in the cultural heritage section of the current Meath County Development Plan and that the restrictive policies, which formed part of the original development plan have been brought forward in the current document.

5.17.5.5. Impacts on specific archaeological sites

Monaghan County Council and some of the observers raise concerns regarding the potential for significant and permanent impacts on a number of specific recorded monuments in the area including megalithic tombs, ringforts etc. Other issues relate to impacts on the intervisibility that exists between monuments and the protection of monuments in the vicinity of access roads.

The Lemgare and Cornamucklagh areas in Co Monaghan come in for particular attention, noted to contain particular clusters of Megalithic tombs. Within the Lemgare area concerns are expressed in particular about the impacts on the setting of Lemgare Court Tomb, ringforts and other recorded monuments to the north and south of the court tomb.

Lemgare Portal Tomb (MO014-022) is located in the townland of Lemgare (not Croaghan as mentioned in one of the submissions) and lies 130m to the west of Tower 107 (Plate 4-13, Appendix 19.1). It lies on the brow of a small hill in the

corner of an agricultural field. It is overgrown with vegetation and is well screened. Mr Moore (EirGrid) noted that the alignment of the monument faces away from the proposed development. I accept the conclusion reached in the EIS that the impact on the setting of the monument is assessed in the EIS will be moderate.

To the north of the tomb site there are two other recorded monuments a ringfort (MO014-021001) and building (MO014-021002), and concerns have been raised in the submissions that the pylons will run almost directly over these structures. It was confirmed by Mr Moore that the overhead line will not directly oversail the monuments. I accept that the impact on the setting of the monument will be significant due to the proximity of the development (c. 90 m) to the west.

The submission by Kathleen Hughes (observer) refers to an unnamed ringfort in the vicinity of Tower 109. EirGrid assumes this to be MO014-028 which is listed in Appendix 14.2. It is described as being situated on the summit of a high ridge and located c. 380 m from the route. The nearest structure is Tower 111. I accept the conclusion reached by the applicant that due to the significant separation distance between the monument there is no potential for direct physical impacts arising from construction and impacts on setting will not be significant.

There are also concerns raised regarding impacts on the Portal Tomb in Lennan Co. Monaghan (MO019-016). Monaghan Co. Council note that the views from the megalith are particularly scenic. It is located on the side of a hill in an agricultural field and is stated to be in good condition. The site is elevated and exposed with expansive views over the surrounding area. The site is located to the west of the alignment between Towers 133 and 134. I accept that the development, which will run in a north-south direction c. 210m to the east of the recorded monument will significantly impact on its setting.

The Court Tomb ‘Giants Graveyard’ in Cornamucklagh South (SMR MO019-037) is located on an elevated ridge to the east of Towers 144. It is partially screened by vegetation. The alignment will pass c. 50m to the west and will impact on its

setting. The impact is assessed to be moderate due to the mitigation provided by screening, which is considered reasonable.

Monaghan Co. Council also refers to the potential impacts on the enclosure (MO027-077) in Corrinenty, Co Monaghan. The site is currently oversailed by the existing Louth-Rathrussan 110kV line and it is proposed to replace an existing poleset on the existing line with one of reduced height. The works will take place within 20m of the enclosure. EirGrid has accepted that the potential does exist for impacts on sub surface archaeological deposits associated with the enclosure. I accept that subject to standard mitigation measures as proposed including the demarcation of the enclosure to prevent damage during construction and archaeological monitoring of all groundworks associated with the replacement of the poleset, impacts will be avoided.

The Black Pigs Dyke is also referred to by Monaghan Co Council. The dyke comprises a series of discontinuous linear earthworks that can be found in Cavan and Monaghan as well as adjoining counties. It may have associations with the Doresy ramparts across the border in Co Armagh. It is acknowledged by the local authority that while there are remnants of the feature in Co Monaghan, none were identified along the line of the route. EirGrid confirmed that no upstanding remains exist but that it is possible that the proposed line route may pass over sub-surface remains of the earthwork. Archaeological monitoring will be carried out to mitigate potential impacts.

Latnakelly fort is identified by the observers as a site that may be vulnerable during construction with a risk of collision and vibration impacts. The perimeter of the fort (MO014-035) adjoins a local access road which will be used by construction traffic. It was confirmed at the oral hearing that the perimeter of the ringfort will be demarcated to protect it during construction and that if necessary smaller machinery and speed controls will be implemented as access the tower site. The enclosure at Corrinenty (vicinity of Tower 180), which will be within 20m of the works will also be demarcated.

The submission by Robert Kenny refers to a number of cultural sites in the area around Dowdstown including Dowdstown House, nearby souterrains, rock art at Fletcherstown, Arch Hall, Wilkinstown, Clongil Castle, Glebe House, early Christian Cross, Fletcherstown Chapel, Kilshine Church, former police barracks and courthouse at Georges Cross and a 1798 monument at the site of Knightstown Bog. EirGrid's response documents the location of these sites and their condition. Arising from the distance between the sites and the proposed alignment there will be no direct physical impacts on any of the sites/structures and impacts on setting will not be significant.

The impacts on the church and graveyard at Rathaine Co Meath (SMR ME030-011-011033) are also referred to. There will be no direct physical impacts on any of these sites and they are well removed from the alignment. The church (in ruins) and graveyard at Rathaine to the east of Philpotstown demesne are well screened by mature trees and forestry to the north and west, which combined with distance means that there will be no significance on their setting.

In terms of potential interference with the line of sight that exists between monuments in Co. Monaghan, (i.e. ringforts to the north at Ardagh and to the south at Raferagh), I accept EirGrid's rebuttal that whilst there may be intervisibility at a distance between monuments, the drumlin landscape affords a limited horizon, which reduces the potential for this to occur.

The proposal will not result in the destruction or the interference with the upstanding remains of any of these monuments. I accept that the potential does exist in some cases for damage or interference with associated remains during construction. Standard mitigation measures are proposed to minimise impacts. The development, once operational will impact on the setting of a number of monuments and these impacts cannot be mitigated.

5.17.5.6. Impacts on Architectural Sites -Protected Structures and NIAH Sites

There will be no direct, physical impact on any of the sites of architectural importance listed in the Record of Protected Structures (RPS) or the National Inventory of Architectural Heritage (NIAH) in the study area. Many of these buildings/structures are located in settlements that are at a remove from the proposed development. There is potential for impacts on the setting of some structures in closer proximity.

The DAHG contends that there will be a significant impact on the setting of St Patricks Church of Ireland, Ardagh, Co. Monaghan and that no specific measures have been recommended to mitigate these impacts. It recommends that the Board consider whether screening by planting should be provided. It also stated that two buildings of architectural interest, Corvally Presbyterian Church and School were not included in the schedule of buildings in Appendix 14.3 (Architectural Heritage) and that the impact of the power line on these buildings needs to be further accessed.

St Patrick Church is a listed building (RPS No 41402713, NIAH No 41402727) and lies within a graveyard on a low hill (Fig 14.9 Volume 3C Figures) to the east of Tower 193 at c 900m. There is low vegetation and a row of deciduous trees around the graveyard. During periods of full foliage, it is difficult to identify the location of the church in the wider landscape (Photograph 1, Appendix 4). Outside these periods, I accept that there will be more open views from the graveyard towards the proposed alignment, with the potential for more significant impacts on the overall setting of the protected structure. These views are not protected.

I accept as stated by Mr Schulze (EirGrid) that a balance has to be struck between mitigating the views from the church on the one hand and the potential to increase impacts on its setting from additional screening. Having observed the site through two seasons, with and without the benefit of full foliage, I consider that the church sits comfortably in its rural surroundings. I am not persuaded that additional screening is warranted and that it would provide any additional benefit to the setting of the protected structure or its relationship with its surroundings. I would

also note that the church is on private grounds and any proposals for additional screening would have to be achieved by agreement. Dr O' Dwyer (DAHG) confirmed to the oral hearing that he had not visited the site.

Corvally Presbyterian Church and School (both identified in NIAH) are included in the schedule of buildings in Appendix 14.3 The confusion that arose regarding their identification can be explained by the fact that whilst both buildings are named after the townland of Corvally, they are located in the townland of Shanco and are listed accordingly (Fig. 14.9 Volume 3C Figures). Both the church and former school are located south of St Patricks Church and were assessed in the EIS. The alignment will be located c 950m to the west. I accept that the impact on these buildings will be mitigated by distance and by their orientation in the opposite direction to the alignment. I do not consider that further assessment is warranted.

Concerns have also been articulated regarding the visual impact of Towers 170 and 171 on Lough Egish Church, a Protected Structure. The location of the church is not identified. The Record of Protected Structures contained in the Monaghan County Development Plan includes RPS No 4140249 described as Church of the Sacred Heart, Tullynamaltra Crossroads, Lough Egish. It is located to the east of Tower 168 (Fig 14.7 Volume 3C Figures). It was confirmed by Mr Gourley (Monaghan Co Council) at the oral hearing that the church is known locally as Aughnamullen Church. The church is located in excess of 2km from the alignment (Fig 14.7 Volume 3C Figures) and no impacts on its setting will arise as a result of the development.

Concerns were articulated by the observers that EirGrid failed to identify Harrison's Mill as a Protected Structure. Whilst I note that there is no specific reference to this particular mill, Mr Moore in his submission to the oral hearing stated that Reduff Mill had been specifically assessed. It is c.450m east of the alignment and had the benefit of screening which reduced the potential for significant impacts on its setting. Ms Clerkin (Heritage Officer) noted that there is a cluster of mills in the vicinity of Reduff including Farm Hill Mill, Harrison's Mill and

other mills. She described Harrison's Mill as intact with mill cottages, a description which mirrors the detail provided for Farm Hill Flax Complex in Appendix 4.3 (Volume 3C Appendices). It appears that there is an assemblage of mills in the area, which may have contributed to the confusion regarding names. I accept that there will be no direct impacts on these structures and impacts on setting will be negligible due to topography and vegetative screening.

There are two Protected Structures located approximately 250m to the east of the construction materials storage yard. These are Moynalty House (Ref No 41403114) described as a detached five bay, three-storey house, (c. 1810) and associated two-storey outbuildings (Ref No 41403185). The house and associated buildings are located on the opposite side of the N2, are orientated in the opposite direction to the alignment and benefit from significant screening. The materials storage yard will be located at a lower elevation and there is no intervisibility between the two sites. In addition, the yard will be provided for a temporary period only for the duration of the works, after which it will be restored to its original condition.

The Heritage Officer of Meath County Council also raised issues regarding impacts on Bective Bridge (Photomontage 66) and Donaghpatrick Bridge, both of which are listed as Protected Structures. I accept that the alignment will be visible in open views from both bridges, which will impact on the outlook from the structures themselves. However, there are limited opportunities where both the alignment and the bridges will be viewed together and accordingly I do not consider that there will be significant impacts on their setting.

Within the MSA, many of the protected structures are associated with demesne landscapes and potential impacts are considered below.

5.17.5.7. Impacts on Demesne Landscapes and Historic gardens.

There are a significant number of demesne landscapes and historic gardens in the vicinity of the proposed alignment, the majority of these occur in Co. Meath. The EIS identifies those that occur within 2 km of the proposed development and

recognises that there is the potential for impacts to arise both at construction and operational stages of the development. Appendix 19.1 of EirGrid's response provides more detail of the original demesnes, their evolution over time and an evaluation of the likely impacts. EirGrid did not have access to the lands associated with any of these properties.

I would point out to the Board that further assessment of the potential impacts on the landscape associated with the individual demesnes is provided under Landscape and Visual Impact.

CMSA

Within the CMSA the alignment will run through the demesne landscapes associated with Shantonagh House and Tully House in the vicinity of Towers 170-175. The issued raised by Monaghan Co Council at the oral hearing relate to the absence of proposals to mitigate the adverse visual intrusion by the proposed development and that the main source of information for EirGrid, the NIAH Garden Survey, is a desk top study and was not based on a physical inspection of the landscape.

In his rebuttal Mr Moore noted that the sites in the NIAH garden survey were identified by the DAHG using the 1st Edition OS maps and that these were compared with current aerial photography to assess the level of survival and change. The veracity of the NIAH assessment was established by examination of aerial imagery and roadside surveys where possible.

Appendix 19.1 of applicant's response demonstrates the changes that have occurred within the demesne landscapes of Shantonagh and Tully over time. The First Edition OS maps show Shantonagh House as a large building with associated outbuildings surrounded by woodland and set in a landscaped demesne. Comparisons between the various editions of the OS maps and more recent aerial photography indicate that the landscape and the demesne setting has changed significantly over the years. The house has been replaced and much

of the woodland that surrounded it has been removed. A small house which was located at the western entrance, possibly a gate lodge has also been removed. It would appear that the only remaining features are some of the original outbuildings and a remnant of woodland to the east.

There is very little left of the original demesne associated with Tully House. The house, various mills, a mill race and woodland have all been removed. Comparisons between original OS maps and more recent aerial photography confirm that the demesne is seriously degraded and its sensitivity to impacts on setting are therefore low. Ms Clerkin (Heritage Officer) referred to the previous milling industry associated with this landscape and the potential for remnants of interesting features. According to applicants' submission the only remaining feature is a pond located to the north of the demesne in the vicinity of Tower 172. Whilst issues have been raised in the submissions regarding impacts on the pond, according to Mr Moore, it remains an isolated feature, which is largely devoid of its original context. It will remain intact following construction and will experience no direct physical impacts arising from the proposed development.

Whilst the alignment will run to the east of the demesne landscapes associated with both houses (Towers 171-174), I accept that the removal of the main features associated with each demesne has significantly altered and degraded the original landscape which minimises the potential for significant adverse effects.

MSA

The EIS identifies the demesne/historic gardens within the MSA, where the potential exists for impacts during the construction and operational phases of the development. The alignment will traverse five of these demesnes (Brittas, Mountainstown, Philpotstown, Teltown and Rahood) and will run in close proximity to others. Issues have also been raised by the observers regarding other demesnes including Ardbraccan, Cruicetown and Bloomsbury. The potential impacts for each demesne is considered below for the information of the Board.

Impacts on Brittas Demesne

Meath Co. Council, An Taisce and a number of other submissions raise concerns regarding impacts on the Brittas estate. It is contended that other solutions should be investigated such as routing the line further to the east or undergrounding this section of the line. Dr O' Dwyer (DAHG) referred to the EIS, which indicated that mitigation may be possible but that this was not precisely defined.

Brittas demesne is located to the east of the alignment and encompasses an area of 224 ha. The demesne accommodates Brittas House, a Protected Structure, located 430m to the east of Tower 266. It is located at the end of a long avenue, which meanders its way in and out of woodland through the demesne lands. The house is well screened by woodland on all sides. There are no views of the house from surrounding publicly accessible areas.

The demesne also includes a number of archaeological monuments including six ringforts, an enclosure and a cross. Three of the ringforts are located within 400m of the proposed line, with the closest at 210m. In the south-east corner of the demesne there is another complex of archaeological sites, including a crannog on the shores of Moynagh Lough, dating back to Christian times.

The demesne is listed in the NIAH garden survey and is described as having its 'Main features substantially present - will some loss of integrity'. It contains a number of important landscape features including a Mausoleum, formal gardens, battle field etc. Comparing the First Edition OS maps with more recent aerial photography, it is clear that the main features are substantially present and the main changes that have occurred relate to former designed landscapes, field patterns etc.

The proposed development will enter the demesne from the north west and travel south eastwards. It will cross the main avenue between the entrance gates and Brittas House, approximately 170m from the entrance into the demesne. A total of 5 no. towers and associated OHL will traverse the lands (Towers 266-270). The

construction of the OHL will involve the removal of vegetation including mature woodland close to the entrance and gate lodge.

The proposed development will be visible as it crosses the entrance avenue close to the gate lodge (Photomontage 45). The removal of trees and the presence of the overhead line and towers in the distance will impact on the setting of the gate lodge, which I note is not listed as a protected structure. The avenue (Figure 3.8 of Appendix 19.1) continues its journey towards Brittas House through woodland. There will be views of the towers and the overhead lines in both directions where it crosses the access road and from within the demesne itself. There will be limited views from the public road due to existing roadside screening, which will not be impacted. The presence of the trees limits visibility of the alignment travelling both to and from the house.

The construction phase of the development will not result in direct physical impacts on any of the recorded monuments/sites within the demesne. However, following completion of the development there will be permanent negative impacts of moderate/significant significance on the setting of a number of monuments located at the western side of the demesne due to the presence of the line. It is not possible to mitigate these impacts. The archaeological complex to the south east of the demesne is well removed and will not be impacted.

Whilst there will be no direct physical impact on Brittas House arising from the proposed development, I accept that the potential exists for impacts on its setting during the operational stage. However, these impacts will be mitigated by distance and by the presence of dense vegetation both between the house and the proposed alignment and along the access route. The dense vegetation ensures that there are no views, when accessing or leaving the demesne, when both the house and the development are visible together. The potential does exist for impacts on the outlook from the upper floor windows of the house during the winter months, where the upper sections of the towers may be visible.

EirGrid have acknowledged the cultural importance and sensitivity of the demesne lands and the potential for substantial impacts on its setting. In attempting to

mitigate these impacts and avoid the demesne lands, alternatives such as routing the line further to the east and west were examined. The alternative to the west was rejected on the basis of increased impacts on Cruicetown Church and Graveyard (National Monument). An alternative route to the east beyond the demesne lands would bring the alignment close to Nobber, increasing impacts on the settlement and its associated archaeological monuments and protected structures.

Responding to questions from the Inspector on how the impacts on Brittas Estate might be weighted against impacts on Cruicetown, if the alignment was routed to the west, Mr Moore stated that given that Cruicetown, is a national monument, is accessible to the public and is prominent in the landscape, it was his opinion that a more significant impact would result if the line was routed in that direction rather than through the Brittas Estate, which is privately owned and inaccessible.

Meath Co. Council are not however persuaded that the impact on the National Monument would be as significant as suggested by EirGrid and recommended in their submission that EirGrid be requested to demonstrate the results of such an amendment to the scheme. I would point out to the Board that there are a significant number of one-off houses on the opposite side of the road and gaining acceptable separation distances would involve routing the line on elevated open ground. The towers would become visible against the skyline, which would increase their dominance and impacts on the setting of Cruicetown and Roberstown. It would also impact more significantly on Protected View No 17.

Another option considered was partial undergrounding (Annex 7, Appendix 12.2, Partial Undergrounding Report). It evaluated a route to the west on the opposite side of the road which would extend over a distance of c 3.2 km with sealing end compounds at either end. These are large structures which in themselves would create significant visual impact. The report evaluated the impact under a number of environmental topics. It concluded that the underground option would reduce the level of visual impact, but that the impact was not so profound to warrant the need for consideration of partial undergrounding. (Refer to Landscape section of

report). It also concluded that there was limited justification for partial undergrounding in terms of cultural heritage and ecology. In my opinion, it would be difficult to justify the undergrounding of the alignment in this location at such exceptional cost, where the impacts are so localised and confined to land in private ownership with limited benefit to the wider public.

I accept that routing the overhead line away from the demesne would be preferable to protect the overall integrity of the demesne. However, routing the alignment through Brittas takes advantage of low lying topography between more elevated open topography to the west and east and minimises other potential impacts on landscape, cultural heritage, ecology etc. I accept that while the impacts on Brittas will be significant, negative and permanent they are largely localised and confined to the demesne land, with minimal impacts from the public realm.

I would also point out to the Board that notwithstanding the presence of an assemblage of features including a protected structure and numerous recorded monuments, Brittas is not recognised in the county development plan to be of such special interest to warrant its designation as an Architectural Conservation Area (ACA) in the same way as, for example, Ardbraccan.

The Board will note that that it is stated in the EIS that there is the potential to mitigate some of this impact by the planting of vegetation along the avenue. The extent to which mitigation can be applied cannot be assessed due to the refusal of the property owner to allow EirGrid access to the lands.

Mr Michael O'Donnell S.C representing Mr Jessop and Mr Jackson from Brittas estate raised a number of issues questioning how the full impact of the proposed development could be assessed without access to the lands. He queried how Mr Moore interpreted 'curtilage' and argued that the house could not be separated from the demesne lands and its associated features in the assessment of impacts. In response Mr Moore confirmed that access to the lands had been sought and refused. Reliance was therefore based on all available databases and cartographic sources, which were used in conjunction with LiDAR,

orthophotography, aerial photography and vantage surveys from public roads to build up a picture of the house and its relationship with the demesne lands.

He noted the provisions of the Architectural Heritage Protection Guidelines (DoEHLG 2004) regarding ‘curtilage’ which states that the extent of curtilage needs to be interpreted on a case by case basis. It should ideally be defined by the planning authority before the inclusion of a structure in the RPS. The description in the RPS describes only the house itself. I accept as stated by Mr Moore during the oral hearing that there is no strong relationship between the house and the area in the vicinity of the entrance and gate lodges. This conflicted with the opinion of Ms Chadwick, Heritage Officer who stated that curtilage would always include access and gate lodges.

It would be difficult, in my opinion, to argue that the area of the proposed development is located within the curtilage of the house due to the distance from the house and the lack of connection thereto. I accept that it could be considered to form part of the attendant grounds and whilst the planning authority has the power to protect all features of importance which lie within the attendant grounds of a protected structure, this must be specified in the RPS. The gate lodge is not listed for protection.

I would point out to the Board that documents were produced at the oral hearing stating that Brittas was included on the Register of Historic Monuments (Submission No 40). When questioned by Mr O Donnell whether he was aware of this when preparing his report, Mr Moore stated that it is not a publicly available list but that the demesne was treated as an area of archaeological significance and high sensitivity. Mr Moore stated that the area delineated on the map is an archaeological area where a notification procedure is in place and does not prohibit development. I note that none of the recorded monuments will be physically impacted by the proposed development.

Under the provisions of the National Monuments Act 1930-2004, where works are proposed to a registered monument there is a requirement to give notice to the

Minister before commencement of works. This process is to enable the National Monuments Service to consider the implications of the protection of the monument. The registered monument is delineated on the map and includes a significant proportion of the demesne lands. It would appear that the notification procedures will, therefore, apply.

Reference was also made at the hearing to S.I No. 249/2012 European Union (Environmental Impact Assessment of Proposed Demolition of National Monuments) Regulations 2012. The regulations amend the National Monuments Act 1930 to give effect in Irish Law to Directive 2011/92/EU to the assessment of the effect of certain public and private projects on the environment, in so far as it relates to the demolition of national monument. It appears to be confined to monuments in the ownership or guardianship of the State or local authority and monuments subject to Preservation Orders. I do not consider that the regulations have any relevance to Brittas, as no demolition is proposed.

Impacts on Mountainstown Demesne

It is a large demesne comprising some 198 ha. It includes Mountainstown House, a Protected Structure dating back to c 1720. The demesne is featured in the NIAH Garden Survey where it is described as having its 'Main features substantially present - peripheral features unrecognisable'. It is evident from the OS First Edition map that whilst some changes have occurred to the demesne, these appear to be relatively minor consisting of alterations to field boundaries hedgerows etc. A significant amount of the original tree plantations, tree lines and field boundaries remain.

The front of the house faces to the east and the alignment will run c.1km to the west. There is planting between the house and the proposed development. The alignment will run through the middle of the demesne with one tower (Tower 289) located within the demesne lands and two towers (Towers 288 & 290) located just outside the boundary. The alignment will oversail a section of an original avenue to the west and original tree lines.

The development will be visible from, and will impact on the overall integrity of the demesne lands. It is also likely to be visible from upper floor windows from the house in distant views. I accept that the impacts on the setting of the house will be limited by distance and by intervening screening, but that the development will result in a permanent negative impact of moderate significance on the setting of the demesne.

Impacts on Philpotstown (Dunderry)

Philpotstown House is a Protected Structure built in the 18th century. It sits in a demesne landscape of 54 ha. The demesne features in the NIAH Garden Survey where it is described as having its 'Main features substantially present-peripheral features unrecognisable'. The main changes that have occurred to the original demesne are alterations to field boundaries and loss of hedgerows and individual trees. The main groups of trees in the vicinity of the house have been retained.

The proposed development will cross the demesne in a north-south direction c 370m to the west of the house. Two towers will be situated within the demesne lands (Towers 340-341) with one close to the boundary (Towers 342). The main wooded area and the most robust treelines around the house are avoided. The house itself is well screened by mature trees to the west and east. There is further screening to the south of the house that will screen views towards the development from within the demesne lands. There will be intermittent views of the alignment from the main entrance to the east.

As the alignment moves south eastwards on lands on the opposite side of the road, views may be available from the upper floor windows of the house during winter months which would affect the outlook from the house. However, due to the extensive mature screening between the house and the alignment, I accept the conclusions reached in the EIS that the overall impact on the setting of the protected structure will be slight, permanent and negative. There will be views of the development from within the demesne resulting in a moderate, permanent negative impact on the setting of the demesne.

Impacts on Teltown Demesne

Teltown Demesne incorporates an area of 138 ha. Teltown House is a protected structure dating from the early 19th century. The demesne features on the NIAH Garden Survey and is described as having its 'Main features unrecognisable – peripheral features visible'. The main changes evident between the OS First Edition maps and more recent aerial photography are changes to field boundaries and infiltration of one-off houses. With the exception of hedgerows defining field boundaries, there is no evidence of significant planting remaining within the demesne. Two towers will be located within the demesne land (Towers 309 & 310). Due to the separation distance, and the degraded nature of the demesne lands, I accept that impacts on the setting of the demesne will not be significant.

The façade of the Teltown House faces west and to the rear there are agricultural buildings. Further east there are the ruins of a church enclosed within a graveyard (protected structure). The alignment will travel to the south east at c. 790m from the house. Having regard to the separation distance and the general orientation of the house, I do not consider that there will be significant impacts on the setting of the house.

Impacts on Cruicetown Demesne

An Taisce have also raised issues regarding impacts on Cruicetown Demesne, which includes Cruicetown House a protected structure. It is included in the NIAH Garden Survey and described as 'Main features unrecognisable - peripheral features visible'. The proposed alignment will pass to the east of the demesne at c. 900 m. A significant amount of agricultural development has taken place in the immediate vicinity of the house and between it and the proposed alignment and accordingly, the impacts of the proposed development on the setting of the house or demesne is not considered to be significant.

Impacts on Whitewood Demesne

Whitewood Demesne extends over 102 ha. It includes Whitewood House, lodge and farm buildings all of which are listed as Protected Structures. It is included in the NIAH Garden Survey and is described as having its 'Main features substantially present - peripheral features unrecognisable'. The house faces east northeast, with the principal views from the front of the house towards the R162 to the east. The house partially overlooks Whitewood Lough to the rear.

The alignment will run approximately 1.6 km to the west of the house on the opposite side of Whitewood Lough and will not traverse the demesne lands. It is acknowledged in EirGrid's rebuttal that three towers will be visible (No's 257, 258 and 259) from second floor windows to the rear of the house. The first and second edition maps indicate that while the setting of the house and the views to the east remain largely unchanged, there have been significant changes to the demesne to the west and north resulting from the clearance of extensive woodland. Notwithstanding this, the sensitivity of Whitewood House to impacts on setting is considered in to be high.

Some of the submissions draw attention to a recent decision by An Bord Pleanála to refuse permission for a windfarm in the vicinity of Whitewood House (PL17. 244357). The windfarm was proposed to the east of the house directly in line with the front of the house and its entrance avenue. In contrast, the proposed development is located to the west and rear of the house. Due to significant screening around the rear of the house there is only a small corridor of visibility. There will therefore be limited visibility of the alignment from the rear of the house, from upper floor windows only. The proposed development will not impact on a protected view over Whitewood Lough towards Whitewood House (Viewpoint 19).

Impacts on Dowdstown Demesne

Dowdstown demesne is a small estate of c.10 ha, located to the south of Mountainstown Demesne. It contains Dowdstown House, a Protected Structure

built in 1793. The demesne is listed in the NIAH and described as having its 'Main features unrecognisable - peripheral features visible'. It is noted that the principal building is still extant but that much of the original woodland shown on the first edition OS map is no longer present and that there has been an alteration to the original access with a new drive to the south east. The front of the house faces east and the proposed development will be located 540m to the west and c. 400m from the demesne. The alignment will not traverse the demesne.

Views towards the alignment will be obstructed by intervening mature tree lines and hedges and by large agricultural buildings to the west of the house. The only views that will be available from the house will be from upper floor windows over the agricultural buildings. It is likely that the alignment will be visible in the distance from the entrance avenue (part of which is a recent addition and which crosses an open field), which will detract from the setting of the demesne.

There will be no direct physical impact on the protected structure and the impact on its setting will be slight.

Impacts on Churchtown House

Churchtown House and associated demesne is located c.115m to the west of Tower 337. The demesne appears on the NIAH garden survey and is described as having its 'Main features substantially present - peripheral features unrecognisable' Churchtown House is not listed in the NIAH Building Survey and is not a protected structure. The house faces south and there is significant screening on its east side, curtailing potential views of the proposed development. The alignment does not cross the demesne but views will be available the front of the house. The impact on the setting of the house and demesne is assessed as moderate in the EIS, which is considered reasonable.

Impacts on Ardbraccan Demesne

Ardbraccan House was built between 1734 and 1770 and was the former seat of the Bishops of Meath since the fourteenth century. It is set in mature pasture land

with formal and walled gardens. It is enclosed by a high stone wall (3m) and mature trees along its western boundary. There are a number of protected structures within the demesne including Ardbraccan House, outbuildings, gate lodge, St Ultan's Church, a former national school, a house and a water pump. The importance of the demesne is reflected in its designation as an Architectural Conservation Area in the Meath Co Development Plan. It is included in the NIAH Garden Survey where it is described as having its 'Main features substantially present - some loss of integrity'. The DAHG query whether the existing wall and screening is adequate to mitigate impacts, or whether additional screening is required.

The proposed alignment will run to the west and will be separated from the demesne by the existing M3. The closest tower (Tower 324) will be at 600m distance. The front façade of Ardbraccan House faces south east so that the principal view from the house is orientated away from the proposed development. The house and its associated outbuildings are well screened by existing mature trees. The other protected structures including St Ultan's Church, former school and a house which are clustered towards the south western corner of the demesne are also screened by existing planting and the western boundary wall. The gate lodge is located on the opposite side of the estate and will not be significantly impacted by the proposed development.

The proposed development will not encroach onto Ardbraccan and there will be no direct physical impacts on the demesne or its associated protected structures. The potential for operational impacts are restricted by existing screening with the potential for limited views from upstairs side elevation windows during winter months. I accept that the overall impact on the setting of Ardbraccan will be imperceptible to slight.

Impacts on Bloomsbury House

Issues have been raised in the NV Irish Farm submission about impacts on the setting of the demesne lands of Bloomsbury, which includes Bloomsbury House

and a boat house, both of which are protected structures. Bloomsbury House is included in the NIAH garden survey and is described as having its 'Main features substantially present-some loss of integrity'.

There will be no direct impacts on the demesne and the impacts on setting will be curtailed by distance (2.5km) and intervening screening

Impacts on Galtrim House

Issues were raised in the submission from Meath Co. Council regarding impacts on Galtrim House. The house and its associated outbuildings are located south west of the alignment. The closest tower is Tower 381, which will be in the region of 450m from the house. There will be no direct impacts on the house or the demesne lands. The demesne has the benefit of screening close to the house which minimises impacts on the setting of the house. The outlook from the house may be affected, particularly from the upper floors.

Having regard to the location of the alignment outside the demesne and at a remove from its main features, significant impacts are not likely to arise.

Impacts on Rahood House

Rahood House and demesne are included in the NIAH Garden Survey and is described as have 'virtually no recognisable features'. The alignment will cross demesne lands to the west and will accommodate two towers (No's 274 & 275). There is a substantial trees screen between the house and the proposed overhead line, which reduces impacts on the house. There will be direct impacts on the demesne but I accept due to the lack of features remaining, the impact will be moderate.

To conclude, the impact of the development on the setting of demesne lands will vary depending on the overall integrity of the original demesne and associated features and the proximity and dominance of the alignment. There are no

proposals contained in the EIS to mitigate these impacts as access to the individual lands was not permitted.

5.17.5.8. Impacts on other sites of cultural significance/ Meath Gaeltacht

Within the CMSA issues have been raised in the submissions regarding impacts on Lough an Leagh Mountain, Mullyash Mountain, the Battle of Clontibret site and the site of the Fair of Muff, each of which is recognised as of historical, social and cultural significance. Within the MSA the proposed alignment crosses the Gaeltach area of Baile Ghib. Concerns have been expressed that the proposed development will deter people from living in the area and from visiting to improve their Irish, which will impact on the preservation of the Irish language.

Lough an Leagh

Lough an Leagh Mountain is a north-south aligned ridge located to the west of the alignment between Bailieborough and Kingscourt in Co. Cavan. It is of significant historic and cultural interest supporting prehistoric stone cairns, a mass rock and the site of the former Lough an Leagh is (Lake of Cures). It also hosts numerous annual events which are of importance to the local and wider community. However, the ridge is not preserved in a pristine state. Parts are planted with commercial forestry and it also accommodates a number of unsightly telecommunications masts and structures, which obscure two of the cairns from view.

The proposed development will not encroach onto Lough an Leagh. It will be located at a distance of 2 km from the eastern side. Whilst there are panoramic views from the mountain over the surrounding countryside and the towers will be visible as vertical elements in middle distance views (Photomontage 41), the alignment will not detract significantly on the mountain or its setting, or its historic and cultural associations.

It is contended in the submissions that EirGrid failed to consider the delicate environment of the Lough an Leagh foothills incorporating Cabra Castle, Dun a Ri

Forest Park, and Moybologue Cemetery. Cabra Castle is a listed as a Protected Structure and Dun a Ri Forest is designated as a County Heritage Site in the Cavan County Development Plan. Both are well removed from the development and are screened from view by the built form of Kingscourt and the forestry associated with Dun an Ri Forest Park. Moybologue Church, located to the south of Bailieborough is also designated as a County Heritage Site but at a distance of 5.5 km to the west of the alignment it will not be impacted by the proposed development. There will be no impacts on the character or setting of any of these sites arising from the proposed development.

Fair of Muff

The site of the Fair of Muff is located between Lough an Leagh Mountain and Kingscourt. According to the evidence given by Mr Moore during the oral hearing the annual fair originated in the late Medieval period at a site known as the 'Fair Green'. It was recorded as a registered archaeological monument but has since been de-classified. The tradition continues annually and takes place to the north-west of the 'Fair Green' on the site of the former Muff Castle which no longer exists. A commemorative plaque and statue has been erected at the cross roads.

Cavan Co. Council consider that there will be a significant impact on the area in the vicinity of Towers 225-228. The route will travel in a northeast and southwest direction at relatively close distance (c 215m to Tower 227). Two of the towers will be visible in the viewshed, which will impact significantly on the character and setting of the site (Photomontage 39). However, whilst the current site seeks to preserve the cultural and historic tradition associated with the original fair, it is not the original site. The site is not protected and the development will not curtail the continuance of the annual horse fair in this location.

Mullyash Mountain

Mullyash Mountain is located to the east of the alignment and north of Castleblaney and at c 6km distance. Mr Moore noted that the area contains a number of significant historical and archaeological sites, including Mullyash Cairn

on its summit. It is a monument which is in the Guardianship of the State. Whilst there are elevated views over the mosaic landscape of small fields, the towers will be barely discernible in long distance views. The proposed development will have no impact on its character or setting.

Battle of Clontibret

The Battle of Clontibret site is located at a cross roads to the east of Clontibret village and to the west of the alignment. The battle took place in March 1595 between the English forces and the Irish army of Hugh O Neill during the nine years' war. A low level monument marks the battle site, which is of historical and cultural interest. There will be no impact either direct or indirect on the character or setting of this site to due the distance to the towers and the screening effects of intervening topography.

Other sites

Whilst I accept that there will be impacts on the setting of other local community events mentioned by the observers such as, Dunderry Fair, Gibstown Drive-In Bingo, the development will not curtail the activities currently taking place at these venues, or interfere with the continued operation of Mike's Kabin a portacabin used by the local community in the Cashel area.

Meath Gaeltacht

The alignment will run through part of the Meath Gaeltacht in the townland of Baile Ghib. Native Irish speakers, who made their submissions through Irish, emphasised the uniqueness of the area and its potential to be destroyed if the development goes ahead. It is their opinion that it will no longer be an attractive place for people to live in, or to visit to improve their Irish. They strongly contend that the line should be placed underground to remove the negativities associated with the overhead line. It is EirGrid's opinion, that the proposal will have a neutral impact on the Gaeltacht.

I accept that while the towers will have an impact on the visual amenity of the area, no evidence has been put forward to suggest that the presence of a high voltage overhead line will result in depopulation or make the Gaeltacht a less attractive place to live or visit to learn Irish. The area is located between Navan and Kells and close to the M3 with good access to surrounding areas and is likely to remain attractive for housing going forward.

5.17.5.9. Failure of EirGrid to properly assess the impacts of the development on the cultural heritage of the area.

The DAHG considered that the information contained in the EIS was inadequate in terms of the assessment of impacts on the setting of individual monuments, buildings, demesnes and complexes such as Teltown ZAA. Similar issues were raised by Monaghan Co. Council who state that the assessment of impacts is insufficient, particularly in relation to the monuments where permanent operational impacts will result. It is their contention that a full photographic record survey of these monuments and their settings and illustrating views to and from the monuments and the landscape should have been submitted. It is also contended that EirGrid has concentrated on individual sites rather than the archaeological landscape. The submission by North East Pylon Pressure suggest that the assessment of cultural heritage is inadequate due to lack of access to land.

EirGrid accepts that access to the entirety of the land would be preferable to assist in the environmental appraisal, but this was not possible due to the refusal of individual landowners. It has exhausted every source of information available to them to gather information on the receiving environment. This included initial desk top studies using all recognised sources of archaeological, architectural and cultural heritage cartographic/ data sets to establish baseline conditions. This information was supported by GIS mapping, aerial photography, LiDAR etc. to provide an understanding of the cultural landscape environment through which the proposed development would pass.

The work culminated in the identification of all recorded and previously unrecorded cultural heritage sites within the study area, each of which was mapped and

evaluated in terms of direct and indirect impacts arising from the proposed development. No evidence was produced at any stage throughout the process, including the oral hearing, that any sites have been omitted from the assessment. In terms of the issues raised regarding assessment of impacts from the individual monuments, Mr Schultz brought attention to the guidelines on how landscape and visual impacts were carried out, noting that they are carried out from public places, which are accessible to the general public. Most of the monuments are on land in private ownership to which the public does not have access.

EirGrid accepts that the potential does exist for sub-surface archaeology to be encountered during the construction phase. As stated by Mr Moore field work does not necessarily guarantee avoidance of subsurface archaeological sites which have no discernible above ground expression. EirGrid accepts that the main operational impacts will be impacts on setting and these impacts cannot generally be mitigated.

In response to the issues raised by the observers regarding further detailed information on individual sites, I draw the attention of the Board to Appendix 19.1, which includes copies of early OS maps, aerial photography for individual sites and structures, which together with the information contained in the EIS, the evidence produced at the oral hearing provides clarity on the significance of the impacts that will arise in respect of those sites where a moderate or greater impact on setting is determined.

In terms of limited access to land, I would point out to the Board that the applicant did have access to those sites of most international and national significance, included those included on the Tentative List for World Heritage Sites and National Monuments in the Ownership and Guardianship of the State. It also had access to those of particular cultural significance to local communities and protected buildings and structures outside the demesne lands.

Within the demesnes, through the use of desk top information including the use of early edition OS maps and more recent aerial photography, it has been in a

position to evaluate the changes that have occurred over time, the value of what remains and the significance of the impact of the development where no access was available. The use of aerial photography and a specially commissioned LiDAR survey in the case of Teltown has assisted in the evaluation of potential impacts on the previously recorded/unrecorded monuments and as noted by EirGrid site surveys do not guarantee the avoidance of subsurface archaeology.

Whilst I accept that a level caution needs to be exercised in terms of accepting an appraisal conducted in the absence of site survey, the lack of access to land has not constrained the applicant in the identification of cultural heritage sites and the evaluation of impacts from the proposed development. I consider that the Board has adequate information on which to make an informed decision on this aspect of the application.

5.17.5.10. Development will devalue heritage assets

Many of the submissions consider that the development will significantly damage features of cultural significance including monuments, sites and the character and setting of protected structures and demesne landscapes.

Notwithstanding the extended linear nature of the proposal, it has a small physical footprint which limits the potential for significant adverse impacts on the archaeological, architectural and cultural heritage sites in the area. Mitigation has been achieved by avoidance and this strategy has been successful. The alignment avoids those features of most significance internationally and nationally in the wider environment such as the Bru Na Boinne World Heritage Site, the Tara Complex and all Monuments in the Ownership or Guardianship of the State.

Avoidance of archaeological heritage and the preservation of archaeological heritage sites and monuments in-situ is the preferred mitigation measure. This has been achieved in the case of all of the recorded sites/monuments identified within the respective study area. There will be no direct physical impact will occur on the upstanding remains of any recorded monument. In terms of architectural/cultural heritage the alignment will not result in the destruction of any listed building or

structure or any area with which local communities have historical/cultural associations.

However, given the linear nature of the development and the rich archaeological environment over which it traverses, the development cannot be provided without some level of impact. In terms of archaeology this will be associated with construction activity close to archaeological sites and in areas of high archaeological potential, which will be mitigated in accordance with best practice.

During the operational phase, it is accepted that impacts on the setting of sites/monuments, protected structures and demesne landscapes will occur. This is minimised by the routing of the alignment so as to minimise impact on protected structures and intact original features of demesne landscapes. Whilst there is potential for further mitigation such as replacement planting (such as in Brittas) this would be dependent on agreement with the landowner.

I consider that it has been demonstrated that impacts been mitigated to the greatest possible extent and that the level of impact must be balanced in terms of the overall wider public interest of improved electricity security and supply. Whilst it is argued that undergrounding may be a preferred solution and would certainly reduce impacts on the setting of buildings/structures and demesne lands, the potential does exist for greater physical disturbance and impacts on the archaeological resource.

5.17.5.11. Development is not in compliance with the provisions of the Meath County Development Plan

Mr Clancy (observer) seeks to draw parallels between the current development and the Board's recent decision (17.PA0038) to refuse permission for a windfarm at Emlagh, which referred to the lack of a wind energy strategy in the plan. He stated that there is no proper provision in the Meath County Development Plan for this major piece of infrastructure. He referred to Map 8.1 of the plan, which shows the preferred route corridor for the proposed north-south interconnector and took

issue with the lack of detail, comparing it with other maps for passenger rail development which identifies transport nodes etc. He requested that the Meath section of the route be excluded for consideration on the basis that it has not been properly provided for in the plan.

Unlike the rail network where there would be passenger nodes along the rail line, there are currently no proposals for any new substations or any other ancillary development along the alignment which would generate interest at a local level for inclusion in the plan. The indicative route of the alignment is shown in the plan. It shows EirGrid's future intensions regarding the transmission system and at the level of detail appropriate to the development plan.

5.17.5.12. Other matters

Mr Moore brought to the attention of the hearing the addition of four new cultural heritage sites placed on the Record of Monuments and Places since the application was lodged (Submission 15). The first is Lemgare Mass Rock (MO-0I500-008), which is located approximately 30m to the east of Tower 108 (Photomontage A - Submission 13A). It lies in a separate field to the tower and there will be no direct physical impacts on the monument arising from the development. It lies in an elevated site, which is overgrown. I accept that due to the proximity of the overhead line (25m), the impact on its setting would be significant.

Three other monuments were added to the record and these are all located within Teltown Church and graveyard (a cross, cross inscribed stone and rock art (ME 017031002-003 and 004). The impact on the church and graveyard is assessed as moderate, negative and these additions will not alter the impact.

Issues were raised by the observers regarding impacts on Rathnally House and Derrypatrick Church. Rathnally House is located c 1.5 km west of Tower 355 and is sufficiently far removed not to be impacted by the development. Derrypatrick Church is located c 500m south west of Tower 387. It is disused and enclosed by vegetation.

5.17.6. Conclusion

Key issues arising in this section relate to the impact of the development on the cultural heritage of the area.

Whilst the routing of the alignment avoids the archaeological, architectural and cultural features of greatest significance within the area, it is accepted that the potential exists for localised impacts during the construction (mainly subsurface archaeology), which can be mitigated.

It is acknowledged that the operational stage will impact on the setting of monuments, buildings, structures and demesne lands, which cannot be effectively mitigated. It is recognised that the greatest impact will arise in the Brittas estate. Having regard to the localised level of impact, which is confined to the estate lands with minimal impacts from the public realm, it is considered that the impacts are acceptable having regard to the wider benefits to the community arising from the proposed development.

Notwithstanding the lack of access to lands and the constraints this imposed on the applicant, having regard to the level of detail provided in the EIS, I consider that the Board has sufficient information to enable it to make an informed decision on the application.

5.18. Cumulative Impacts and Impact Interactions

5.18.1. Environmental Impact Statement

Cumulative impacts and impact interactions are considered in Chapter 10 of Volume 3B of the EIS. It identifies proposed and potential developments occurring within the study area and evaluates the cumulative environmental effects of these under environmental topics. The report concludes that there is potential for localised cumulative effects on particular receptors in respect of landscape and cultural heritage.

Impact interactions are identified in Table 10.5 of Chapter 10 and potential interactions are summarised in Table 10.6. The report concludes that while there is potential for impacts to interact, it is unlikely as a result of the mitigation measures proposed that any of these interactions will result in significant additional impacts that are not already anticipated by each environmental topic.

5.18.2. Issues raised by observers during the course of the application and during the oral hearing

During the application for approval and oral hearing, observers raised concerns regarding cumulative impacts of the proposed development and impact interactions. These are set out in each environmental topic of this report.

The applicant's response to the issues raised is contained in Chapter 8 of EirGrid's submission to the Board dated the 19th October 2015.

5.18.3. The Oral Hearing

Issues arising in respect of cumulative impacts were principally addressed in Module 1.18, Transboundary, Cumulative Impacts and Impact Interactions, on the 6th April 2016, day 16, of the oral hearing. No submissions were made by observers.

In attendance for EirGrid were:

- Jarlath Fitzsimons, Senior Counsel.
- Leah Kenny, Operations Director and Director of Planning, RPS.
- Daireann McDonnell, Senior Ecologist, TOBIN.
- Des Cox, Senior Planning Consultant, EirGrid.
- Aidan Geoghegan, Project Manager, EirGrid.
- Joerg Schulze, Senior Landscape Architect, AECOM.
- Fergal McParland, Programme Manager, EirGrid.
- Robert Arthur, Senior Consultant (Construction), ESBI.

5.18.4. Assessment

Cumulative impacts are those which may arise collectively from a number of projects (existing or proposed) or from the combined effect of individual impacts.

As discussed in individual sections of this report, it is generally considered that cumulative impacts are unlikely to arise from the combined effect of the proposed development, with other existing or proposed development, for following environmental receptors population and economic, land use, soil, water, air, climate and material assets. This is by virtue of the small number of projects which may give rise to cumulative impacts and their distance from the proposed development.

Notwithstanding the above, cumulative impacts on landscape and visual effects, including on the setting of features of cultural heritage and the context for tourism and local amenities, are likely to arise when the development is seen with other development (e.g. wind farms) and are likely to be significant locally. Due to the substantial lack of inter-visibility between the proposed development and other existing or proposed development, and the absence of any collective dominance in the landscape, cumulative impacts in the wider landscape are unlikely.

Having regard to the linear nature of the proposed development, the separate and modest construction sites and the proposed means to mitigate construction

impacts, the combined effects of individual impacts are also not considered to be significant for any environmental receptor.

Impact interactions, again are dealt with by environmental topic where they arise. However, it is considered that, subject to mitigation, impact interactions are generally unlikely to be significant, except for impacts on those people living in close proximity to the route. For these, it is likely that the proposed development has given and will give rise to significant interactive impacts as a consequence of the perceived impacts on health, land and property values and visual amenity.

5.18.5. Summary and Conclusion

This section of the report has focused on cumulative impacts and impact interactions. It is considered that locally significant cumulative impacts are likely to arise in respect of landscape and visual impacts, including on the setting of features of cultural heritage and the context for tourism and local amenities. Whilst impact interactions, subject to mitigation, will not generally be significant, it is considered that it is likely that the proposed development has and will give rise to significant interactive impacts on people living in proximity to the route as a consequence of the perceived impacts on health, land and property values and visual amenity.

5.19. Transboundary Impacts

5.19.1. Environmental Impact Statement

Transboundary impacts are dealt with in Chapter 9 of Volume 3B of the EIS, (Common Chapters). Specifically, the Chapter identifies impacts arising as a consequence of the development on the environment in Northern Ireland. Impacts are summarised below.

Impacts arising as a consequence of the development as a whole are dealt with in Volume 4 of the EIS, Joint Environmental Report.

5.19.1.1. Transboundary Impacts

Chapter 9 of the EIS identifies the following potential impacts on the environment of Northern Ireland, as a consequence of the proposed development in Counties Monaghan, Cavan and Meath:

- Population and economic – There will be wider economic benefits arising from improvements to the electricity grid on the island of Ireland which will be experienced in both jurisdictions.
- Land use – The proposed development lies in close proximity to, or oversails, a small number of land parcels in Northern Ireland. Impacts on these land parcels are considered to be imperceptible.
- Tourism – The proposed development is generally removed from tourist attractions in Northern Ireland. It is not anticipated, therefore, that the proposed development will have any significant impact on tourism and amenity in the Armagh/Monaghan border area.
- EMF – EMF emissions will comply with ICNIRP and EU guidelines on exposure. Furthermore, as electric and magnetic field levels dissipate within a short distance of the OHL, no significant transboundary impacts will occur form the proposed development.
- Flora and Fauna – The proposed development will have no physical works in Northern Ireland, therefore no direct impacts on habitats will arise. Impacts on mobile species (e.g. badgers, otters and bats) are not considered to be significant by virtue of the nature of the proposed development. No impacts on sites of national or European nature

conservation interest are predicted. Impacts on Whooper Swan and other bird species that may use sites on either side of the border are likely to be imperceptible due to absence of flightlines between jurisdictions and distance of important sites from border area.

- Soils, Geology and Hydrology and Water – Impacts are predicted to be limited to the immediate area of the proposed towers. No impacts on geology, surface water or groundwater conditions of Northern Ireland are therefore predicted as a consequence of the development.
- Air – No significant transboundary impacts are predicted for noise or vibration as (a) impacts will meet relevant limits at nearest sensitive receptors, and (b) no sensitive receptors in Northern Ireland are located within 50m of the proposed development. The proposed development will contribute positively to a reduction in transboundary impact on climate through facilitating a reduction in national greenhouse gas emissions, reductions in SO2 and NO_x. Impacts on air quality will be imperceptible.
- Landscape – Local transboundary landscape impacts will occur in Northern Ireland as a result of the alignment between Towers 102 and 110. Impacts are considered to be locally significant (landscape character and visual effects) with the development visible for c.500m of the public road in County Armagh. No significant transboundary impacts are predicted beyond 600-800m, although views of parts of certain towers will be distantly visible from unscreened locations up to 1 to 1.5km from the transmission line, particularly from elevated parts of the landscape.
- Material Assets (General) – There will be a positive transboundary impact associated with providing a high capacity electricity transmission line between the two jurisdictions, leading to improvements in efficiency of the all-island electricity market, security of supply and connection of renewables to the network. There will be no transboundary impacts on gas infrastructure or telecom service operating in Northern Ireland. Waste will be managed in accordance with a *Construction Waste Management Plan.* Waste material will not therefore be transported to facilities in NI.
- Material Assets (Traffic) - All proposed haul routes to tower sites are located in County Monaghan. Some construction materials, stored at the

materials storage yard in Monaghan, may be sourced from NI. Similarly, the location of construction workers (residence) is unknown and some may commute to the construction materials storage yard or to construction sites. Volumes of traffic associated with materials and/or workers coming from NI are not considered to be large. Transboundary impacts are considered therefore to be minimal.

- Cultural Heritage – No direct physical impacts on known sites of cultural heritage in Northern Ireland are predicted as a consequence of the development. During its operational phase it is predicted that the development will have a permanent, moderate, negative impact on the setting of one archaeological monument (enclosure, ARM 023:004) which is situated c.97m from Tower 106, in County Armagh.

5.19.1.2. Joint Environmental Report

Volume 4 of the EIS comprises a Joint Environmental Report of the proposed development, prepared jointly by the applicant and SONI. The JER takes account of the European Commission's '*Guidance on the Application of the Environmental Impact Assessment Procedure for Large Scale Transboundary Projects'* (EU, 2013). It comprises an appraisal of the impacts arising from the project as a whole. The report draws the following conclusions:

- Population (Socio-economics) – The construction phase of the project will result in a significant capital spend that is likely to benefit the assessed area and wider area. The routing of the development is considered to present the best overall option of those considered and maximises distance between the development and settlements, residential development and community facilities. No significant socio-economic effects are therefore predicted. Economic benefits arising from improvements to the electricity grid will be experienced in both jurisdictions.
- Population (Tourism) – No direct impacts on tourism sites are predicted. Negative impacts comprise those arising from construction (noise and traffic), impacts on the setting of cultural heritage sites and landscape and visual impacts. Tourism impacts as a result of visual and cultural effects at

tourism sites include the Argory, Navan Fort, Benburb, the Monaghan Way, Bective Abbey and the Boyne Valley Driving Route.

- Population (Land Use) – Construction activity will cause short to medium term residual effects on c.124ha of land and long term effects on 1.4ha of land at the construction material storage yard. Approximately 22.2ha of agricultural land will be lost to agriculture at Turleenan substation. Residual long term impacts will occur on 10.5ha, due to the restriction of land use at the base of towers and towers will be an obstacle to farm machinery. Approximately 14.8ha of commercial forestry will be cleared under the OHL. The presence of the line will pose a further safety risk on farms and may restrict construction of some agricultural buildings. Overall impacts on land use is considered to be imperceptible.
- Material Assets – No significant impacts are predicted on material assets. The development does not provide an obstacle for aircraft, particularly those operating at Trim airfield.
- EMF – The maximum EMF levels from the proposed development are below EMF guidelines for Ireland, Northern Ireland and the EU. Authoritative reviews of scientific research on topics relating EMFs to health of humans and other species do not show that EMFs at these levels would have adverse effects on populations.
- Traffic – The operational phase of the development will generate minimal traffic volume. The construction phase will generate more traffic for a temporary period. Construction will consist of multiple discrete construction sites. Access will be achieved via existing field accesses and internal access tracks where available. The volume of vehicles required to attend each construction location will be relatively few and traffic will be spread out over several weeks. Due to the length of the proposed line, traffic will be dispersed over a large area during construction. Construction of the substation at Turleenan, Co. Tyrone, extension of Woodland sub-station and operations at the proposed materials storage yards will generate higher volumes of traffic over a longer period but these will not result in congestion on the road network. A Construction Traffic Management Plan will minimise the impact of the development at construction stage. Mitigation

measures in respect of the proposed transport of three 222t transformers from Warrenpoint to Moy will minimise disruption to road users.

- Noise – Highest noise levels will be emitted from the development during construction. Impacts will be short term and with mitigation will not be significant. Noise arising from annual helicopter survey is not expected to cause any significant noise impact due to its short term and transient nature and advance notice given to landowners. Operational noise will be limited to intermittent corona noise and continuous transformer/plant noise at the substation. Predicted noise levels are below recommended levels and no significant impacts are anticipated.
- Ecology – The proposed development will not adversely impact on populations of European and/or nationally protected habitat/s species in either jurisdictions, however it has the potential to impact on local populations of protected fauna. With mitigation, residual impacts will be minor negative on hedgerows/treelines, Wintering Birds (Whooper Swan) and Breeding birds (Lapwing). All other impacts are considered negligible.
- Soils, Geology and Hydrogeology – Greatest potential impacts will occur during construction. Tower locations have been selected to avoid lacustrine deposits. No intact peat has been identified at any tower location. With proposed mitigation measures no significant impacts are predicted.
- Water – Greatest potential impacts will occur during construction. Tower locations have been selected to avoid know areas of flood plains and river banks where possible. With proposed mitigation measures no significant impacts are predicted.
- Air and Climatic Factors – The development has the potential to have positive long term residual impacts on greenhouse gas emissions. No significant dust emissions are predicted. Traffic emissions will not give rise to significant air quality effects. With mitigation, no significant local air quality effects are predicted.
- Cultural Heritage – Mitigation measures will be implemented during construction to minimise and/or eliminate impacts on previously recorded features and to resolve any unknown features discovered during

construction. The development will not have any direct physical impact on the upstanding remains of any known archaeological sites or architectural feature. It will result in a significant impact on one demesne, Brittas, and will have a moderate negative impact on a further demesne site. There will be likely significant impacts on the setting of a number of features, with 24 moderate negative impacts, 7 moderate to significant impacts and 6 significant negative impacts to archaeological sites. In addition, the development will result in 3 moderate negative impacts and 1 moderate to significant impact to architectural sites.

- Landscape – The proposed development will inevitably have landscape and visual effects. Considerable efforts have been made at routing and design stage to avoid or minimise these impacts where possible. The resultant route will result in the least impacts to the landscape and visual resource of the assessed area. Mitigation measures will reduce visual impacts of the proposed Turleenan substation. The development will result in significant adverse impacts upon the landscape of the assessed area and on the visual amenity afforded from many locations from within the immediate area following the line route. The landscape and visual resource of the wider assessed area along the proposed interconnector will not deteriorate to a significant degree.
- Cumulative Impacts and Interactions – Cumulative effects of the development with other planned developments are not considered to be significant. However, separate significant landscape and visual cumulative impacts with the proposed interconnector and the proposed wind turbines at Teevurcher, Raragh, Lisduff, Emlagh wind farm and the future Kingscourt sub-station are predicted to arise.

Included in Appendix C and D of the JER is the Consolidated EIS and Consolidated EIS Addendum, respectively, for the proposed development in NI.

5.19.2. Issues raised by observers during the course of the application and during the oral hearing

In the course of the application and oral hearing, observers raised issues regarding the impact of the development on lands within Northern Ireland (construction close to the Border). In addition, the Department of Environment (NI) made the following comments on the application for approval:

- DETI Energy Branch – Supports the proposed development, which contributes to its strategic aim for a more secure and sustainable energy system.
- Armagh City Banbridge and Craigavon Borough Council – Call for the project to be placed underground.
- DCAL Inland Fisheries – State that during construction there is a risk that pollution (suspended solids) could enter watercourses with impacts at significant distances downstream.
- Northern Ireland Environmental Agency (NIEA) – Subject to conditions in respect of mitigation, they have no concerns regarding impacts on archaeological heritage, water, soil, air, natural heritage, landscape or traffic.

The applicant responded to the issues raised in Chapter 8 of their submission to the Board of the 19th October 2015 (the Response document).

5.19.3. The Oral Hearing

Issues arising in respect of transboundary impacts were principally addressed in Module 1.18, Transboundary, Cumulative Impacts and Impact Interactions, on the 6th April 2016, day 16, of the oral hearing. No submissions were made by observers.

In attendance for EirGrid were:

- Jarlath Fitzsimons, Senior Counsel.
- Leah Kenny, Operations Director and Director of Planning, RPS.
- Daireann McDonnell, Senior Ecologist, TOBIN.

- Des Cox, Senior Planning Consultant, EirGrid.
- Aidan Geoghegan, Project Manager, EirGrid.
- Joerg Schulze, Senior Landscape Architect, AECOM.
- Fergal McParland, Programme Manager, EirGrid.
- Robert Arthur, Senior Consultant (Construction), ESBI.

5.19.4. Assessment

5.19.4.1. Transboundary Impacts

Other sections of this report consider the likelihood of significant impacts arising as a consequence of the proposed development, during construction and operation. Having regard to the conclusions drawn, in particular regarding the limited geographical extent of many impacts, I would generally concur therefore with the applicant that, subject to the implementation of mitigation measures, significant transboundary effects are unlikely to arise for the majority of environmental receptors. However, I would accept that significant landscape and visual effects are likely to arise where the proposed development is viewed at close quarters (c.600-800m) in Northern Ireland. Similarly, I would accept that the setting of the enclosure (ARM 023:004) is likely to be adversely affected by the proposed development.

5.19.4.2. Joint Environmental Report

The proposed development comprises 103.35km of a larger electricity transmission project which extends, in total, over 135km, across Ireland and Northern Ireland. The JER aims to assess the impact of the whole project in its entirety.

Having regard to the consideration of likely impacts arising as a consequence of the proposed development in this State, and the similar nature of the proposed development in Northern Ireland, I would generally concur with the key findings of the report. Notably, I would accept that the most significant impacts likely to arise as a consequence of the development, as a whole relate, relate to landscape and visual effects and impacts on cultural heritage. Indirect impacts on a small

number of visitor attractions/local amenities may also arise. Impacts on other environmental receptors can generally be adequately mitigated.

Of note, the appraisal of the proposed development, as a whole, does not identify any significant additional impacts which may arise as a consequence of the entire development, that are not already identified. I am satisfied, therefore, that the assessment of the project as a whole does not raise issues for the assessment of that element of the proposed development in this jurisdiction.

5.19.5. Summary and Conclusion

This section of the report has focused on transboundary impacts. It is considered that transboundary impacts, likely to occur within Northern Ireland, as a consequence of the proposed development in this jurisdiction are confined to landscape and visual effects of the development and impacts on cultural heritage in the vicinity of Towers 102 to 110. With regard to impacts of the development as a whole, it is considered that the proposed development will give rise to similar environmental effects in Northern Ireland and in the Republic of Ireland. Further, no additional impacts arise as a consequence of the development as a whole that are not already identified. I am satisfied therefore that the assessment of the project as a whole does not raise issues for the assessment of that element of the proposed development in this jurisdiction (or indeed the project as a whole).

6.0 ENVIRONMENTAL IMPACT ASSESSMENT

6.1. Environmental Impact Statement

The application was accompanied by an EIS, which is mandatory for the proposed development under the provisions of Class 20 of Part 1 of Schedule 5 involving the '*construction of an overhead electrical power lines with a voltage of 220kv or more and a length of more than 15km'.*

The EIS is laid out as follows:

- **Volume 1** - Statutory Particulars (Volume 1A) and Planning Drawings (Volume 1B).
- **Volume 2** -Planning Report/Associated Appendices (Volume 2A).
- Public and Landowner Consultation Report/Associated Appendices (Volume 2B).
- **Volume 3** - Environmental Impact Statement. Non-Technical Summary (Volume 3A), Common Chapters/Associated Figures Appendices and Reference Material (Volume 3B), Cavan/Monaghan Study Area/ Associated Figures and Appendices (Volume 3C), Meath Study Area/Associated Figures and Appendices (Volume 3D).
- **Volume 4** - Joint Environmental Impact Report in respect of the overall proposed interconnector /Associated Appendices
- **Volume 5** - Natura Impact Statement.

As per the requirements of the EIA Directive, the EIS:

- Describes the project and provides information on the site, the design of the proposed development and size of the project,
- Describes the measures envisaged to avoid, reduce, and if possible, remedy significant adverse effects,
- Provides sufficient data to identify and assess the main effects which the project is likely to have on the environment,
- Provides a description of the main alternatives studied by the developer an indication of the main reasons for the choice of alternative put forward, taking into account environmental effects, and

- Includes a non-technical summary of the above information.

With regard to the above, I draw the Board's attention to the concerns by many of the observers that the lack of access to lands provided inadequate baseline information on which to establish the likely effects of the development on the environment. This matter is considered, where relevant, in the different topic sections of Section 6.0 of this report (Planning Assessment).

The lack of access to lands is acknowledged by the applicant in the EIS. I note that whilst access was granted to c.25% of lands, visual assessments were carried out in respect of a further c.38%, resulting in an assessment of c.63% in total of the lands forming part of the development. The appraisal was assisted by the use of LIDAR (recognised to have a high degree of accuracy), high resolution aerial photography, the use of published data sets/on line mapping, extended ecological surveys etc. EirGrid were able to demonstrate the accuracy of the information provided during the various modules of the oral hearing.

The Board will note from the various sections of this report the level of detail obtained and presented on the existing environment. I draw the attention of the Board, for example, to the identification of the farming enterprise types along the alignment which showed a very low margin of error (Land Use section of the report) and to the presentation by Dr Crushell (Submission No 20) showing the level of detail provided with regard to habitat mapping. It was also confirmed during the oral hearing that the findings of the desk top studies were confirmed in every case by the subsequent field surveys, where access was made available.

Having reviewed the EIS, NIS and all the supporting documentation to the application, the observers' submissions, applicant's response and having considered the matters raised at the oral hearing, I am satisfied that the information is sufficiently detailed and comprehensive to allow the Board to carry out a robust and accurate assessment of the development for the purposes of environmental impact assessment.

6.2. Environmental Impact Assessment

In accordance with the requirements of Article 3 of the EIA Directive and Section 171A of the Planning and Development Act, 2000 (as amended), the environmental assessment is carried out under the following headings:

- – Human beings, flora and fauna
- – Soil, water, air, climate and the landscape
- – Material assets and cultural heritage
- – Interactions between the foregoing.

The EIA has had regard to the application documentation, including the EIS, the NIS, the Joint Environmental Report, the written submissions, the applicant's response, the oral hearing proceedings and the Planning Assessment completed by myself, and Deirdre MacGabhann (Senior Inspector).

6.2.1. Likely Significant Direct and Indirect Effects

6.2.1.1. Human Beings, Flora and Fauna

Impacts on human beings are considered in the EIS under four headings, impacts on population and economic, land use, tourism and amenity and electric and magnetic fields.

Human Beings – Population and Economic

Direct and indirect impacts will arise as a consequence of the construction and operational phases of the development. The development will result in direct and indirect jobs, on and off site over the construction period, and will contribute positively to the local economy with the purchase of materials and economic activity in shops, restaurants during construction. During the operation, the development will contribute to the provision of a robust electricity transmission system within the State to meet societal needs, and to wider national and European policy objectives of an integrated and sustainable energy market.

Having regard to the likely visual impact of the proposed development, and concerns in respect of health, it is considered that the proposed development may indirectly impact on residential property values/ability to sell, particularly, for those properties in close proximity to the route. Impacts on agricultural land are considered to be less significant. Due to the arrangements in place (including for compensation) set out in the ESB/IFA Code of Practice, it is considered that significant adverse impacts on the development potential of lands/property are unlikely to arise.

Having regard to the narrow corridor affected by the proposed development and its routing, away from population centres and community facilities, it is considered that the development will not significantly impact on population, rural activities, community events or facilities. Impacts on the Gaeltacht will be limited to visual effects in proximity to the alignment.

The applicant's proposals for community gain represent a reasonable attempt by the applicant to address some of the adverse effects of the development. However, there is substantial public opposition to the project and little local community acceptance of it in its current form.

Cumulative impacts on population and economic, from the proposed development in conjunction with existing, planned or proposed developments, are not likely to arise.

Human Beings – Land Use

Land uses along the length of the alignment comprise almost wholly agricultural land. Direct, indirect, short and long term impacts will arise as a consequence of the construction and operational phases of the development.

Having regard to the relatively modest land take, the continued use of land for agriculture under and in the vicinity of the proposed development and the relatively limited visual impact of the development, it is considered that the

proposed development will not adversely impact on the farming community, the rural economy or the clean and green image of agriculture. It is recognised that the development may constrain the future development of McCormack Farms horticultural enterprise.

It is acknowledged that the construction of the proposed development, and to lesser extent operation, will be a cause of inconvenience to the farming community. However, with the proposed mitigation measures, and conditions recommended below, it is considered that residual impacts arising from the construction and operational phases of the development will not be significant.

Cumulative impacts on land use, from the proposed development in conjunction with existing, planned or proposed developments, are not likely to arise.

Human Beings – Tourism and Amenity

Impacts that are considered to arise are primarily indirect impacts. The proposed development is routed away from the main tourism resources of the study area, however, it is considered that the development will result in localised impacts on the setting of, or view from, a small number of tourist attractions.

Impacts on angling are not considered to be significant due to the routing of the development away generally from lakes and rivers and having regard to the proposed mitigation measures to protect water quality. Visual impacts on Lough Morne are noted, together with local impacts on the Ballybay Castleblayney Lakeland area as anglers travel between lakes.

Whilst it is accepted that the proposed development will detract from the quality of natural and built environment through which it passes, which provides a context for visitor experience, the proposed development will impact on a relatively narrow corridor and is unlikely, therefore, to significantly impact on visitor experience, or the tourism resource, of the three counties through which it passes or tourism associated with *Ireland's Ancient East*.

Cumulative impacts on tourism and amenity, from the proposed development in conjunction with existing, planned or proposed developments, are not likely to arise by virtue of the relatively modest visual presence of the proposed development and the absence of substantial inter-visibility with other development.

Human Beings – Health (Electric and Magnetic Fields)

No effects from EMF will occur during the construction phase of the development. Exposure to EMF will only occur during the operational stage of the development once electricity starts to flow through the line.

I accept that in order to mitigate significant impacts on human health, the route of the alignment has been designed to maximise, as far as possible, the separation distance between the overhead line and residential properties. I accept that there are existing residential properties within 50m of the alignment where the unused section of the existing Moneypoint to Woodlands 400 kV line will be used to accommodate an additional circuit. To mitigate impacts on this section of the line it is proposed to introduce optimal phasing which will result in a reduction in EMF with distance from the line.

It has been established in the EIS that the proposed development will operate below the guideline levels established by ICNIRP and accordingly will afford sufficient protection to the public. Significant research shows that EMF at these levels would not have effects on population.

It is EirGrid's intention that the proposed development will be designed and operated in accordance with ICNERP guidance. I do not, therefore, consider that there any risk posed to human health as a consequence of the proposed development.

Due to the nature of electric and magnetic fields which dissipate with distance, cumulative impacts on health from the proposed development in conjunction with existing, planned or proposed development are not likely to arise.

Flora & Fauna

Designated sites/undesignated sites of conservation interest -There will be no direct physical impact on any Natura 2000 site. No development will take place within the boundary of the SAC on any other designated site of ecological interest during the construction or operational stage of the development. The alignment also successfully avoids other non-designated sites of high conservation interest including bogs, lakes, rivers and other wetland features.

During construction, the potential exists for indirect effects on both designated and non-designated sites. Subject to the mitigation measures proposed to protect water quality, there will be no significant impacts on any of these sites.

There will be no direct discharges to surface water during the operational stage and accordingly no impacts are predicted.

Cumulative impacts on these sites, from the proposed development in conjunction with existing, planned or proposed development, are not likely to arise

Habitats -The alignment avoids habitat of higher ecological importance. I accept that given the low ecological value of this habitat and the limited footprint associated with each tower site, the impact associated with construction will be a direct short term negative impact.

Where hedgerows and treelines are impacted by the development they are assessed as being generally of low to moderate value. I accept that the mitigation measures proposed (careful management of clearance, reinstatement and replanting) minimise interference and preserve their ecological importance.

In terms of woodland removal, the greatest impact will arise in the Brittas estate where mature deciduous woodland will be removed to accommodate the proposed development. Whilst I accept that the woodland contributes significantly to the amenity of the estate, it does not constitute native woodland and includes a high level of non-native mature broadleaf species and invasive shrubs. I accept the conclusion reached in the EIS, that in terms of habitat loss the impact is moderate.

Cumulative impacts on these habitats, from the proposed development in conjunction with existing, planned or proposed development, are not likely to arise

Terrestrial Species – It is accepted that there are a number of protected terrestrial species which may be significantly affected, either directly or indirectly by the proposed development. These include badger, otter, bats, Marsh Fritillary Butterfly and other wildlife species.

I accept that the location of the alignment on improved pasture land and generally at a remove from the preferred habitat of these species minimises the potential for significant effects on their breeding, foraging and commuting habitat. Subject to the mitigation measures proposed, which include pre-construction surveys, and careful monitoring under the supervision of the Ecological Clerk of Works, I accept that direct impacts on the species can be minimised.

Fisheries and aquatic species – There will be no direct impacts on any aquatic species as the works areas are separated from surface water bodies. There is potential for significant indirect effects from discharges arising from the proposed development. Subject to the effective implementation of the mitigation measures proposed and on-going monitoring, there will be no significant effects on fisheries or aquatic species. There will be no discharges to the water environment during the operational stage, which removes any potential for significant effects, direct or indirect.

Cumulative impacts on these terrestrial and aquatic species, from the proposed development in conjunction with existing, planned or proposed development, are not likely to arise

Birds –No significant direct/indirect effects are predicted on Kingfisher as its breeding / nesting habitat within the banks of watercourses will be avoided by the development. The species is not a collision risk and accordingly it is considered that no significant direct/indirect impacts on the species will arise during the operational stage.

The construction stage may result in disturbance to foraging Whooper Swan but this will be temporary. The most significant impacts will occur during the operational stage associated with collision and potential displacement from traditional foraging and feeding sites. I accept that the predicted collision risk is unlikely to give rise to significant impacts on county or national Whooper Swan populations.

The potential for cumulative impacts with Emlagh (now refused) was considered in the EIS. Bird diverters were proposed to mitigate impacts and no significant residual impacts were predicted. Having regard to the reduced overall footprint of the proposed new windfarm development (Castletownmoor) and the mitigation proposed in respect of the proposed development, I do not consider that the potential for cumulative impacts arise. The Castletownmoor development will, in turn, be subject to assessment, including cumulative impact assessment.

6.2.2. Soil, Water, Air, Climate and the Landscape

Soil

Direct impacts are likely to arise during construction of the proposed development, notably with the construction of towers, materials storage yard and extension to Woodland sub-station. Having regard to the limited footprint of the development, to the modest foundations required and the proposed means to mitigate impacts on soil, geology and the hydrological environment, it is considered that no significant impacts on soil will arise.

With regard to the implementation of proposed mitigation measures, including conditions of the permission, it is considered that significant impacts are unlikely to arise from the interaction of the development with historic mines or contaminated land or on geological heritage.

Cumulative impacts on soil, from the proposed development in conjunction with existing, planned or proposed developments, are not likely to arise.

Water

The key water receptors within both study areas are largely avoided by the development. There will be no direct discharges of polluting matter to water. Construction activity has the potential to result in indirect effects. Having regard to the short term and localised nature of the impacts, and the mitigation measures proposed, it is considered that no significant impacts on water will arise.

There is potential for impacts for direct impacts on groundwater during the construction of foundations with localised drawdown of the water table. Having regard to the limited extent of the excavations below ground level and the time frames for foundation construction, impacts on groundwater will not be significant. The alignment is routed away from residential properties which reduces the potential for impacts on wells. Subject to mitigation which includes monitoring and the provision of a replacement supply if required, it is not considered that there will be significant impacts on water supplies.

A small proportion of the towers will be located in areas that are subject to flooding. However, it has been demonstrated in the EIS that the proposed development will not create a flood risk or exacerbate existing conditions. Provided surface water discharges from the materials storage yard are limited to greenfield run-off rates and suitably treated as documented in the EIS, there will be no contribution to flooding.

There will be no direct discharges to the water environment during the operational stage and no residual impacts are predicted. Having regard to the separation distance to other existing/planned development and the significant mitigation measures proposed to protect water quality, cumulative impacts on water quality from the proposed development, in conjunction with existing, planned or proposed development are not likely to arise.

Air

Direct impacts are likely arise, from the construction and operational phases of the development, as a consequence of construction activity and noise emanating from the OHLs once in use. Temporary noise and vibrational impacts, arising in close proximity to construction sites and access routes, will be managed and maintained within acceptable levels for the duration of the construction and will not give rise to significant impacts on amenity.

Having regard to the small number of properties in close proximity to the proposed development, the level of corona noise which is predicted to occur and adherence to international standards, it is considered that the development will not give rise to significant noise nuisance on sensitive receptors as a consequence of corona noise. However, it is accepted that corona noise is likely to cause localised noise nuisance in quiet rural environments, under certain weather conditions.

Cumulative impacts, from the proposed development in conjunction with existing, planned or proposed infrastructure, are not likely to arise. However, local, temporary cumulative effects from corona noise may arise where the line traverses existing or proposed OHLs.

Climate

Direct and indirect impacts will arise as a consequence of the proposed development during construction and operation. Temporary short term impacts on air quality (including dust) may arise during construction of the proposed development from construction traffic and related equipment.

However, having regard to the short duration of construction works, their relatively modest nature, the linear nature of the project and the proposed means to reduce emissions, impacts are not considered to be significant.

Once operational, there will be no emissions to air from the proposed development and any associated maintenance traffic will be very modest. However, the

development will facilitate greater uptake and transfer of renewable energy and will have a long term, positive impact on climate change.

It is possible that with other wind energy development, positive cumulative effects on climate change may arise.

Landscape

Direct, indirect and cumulative impacts will arise as a consequence of the proposed development. Having regard to scale and form of the proposed development, it is considered that it will give rise to significant direct adverse landscape and visual effects including significant impacts on:

- Residential property in close proximity to the route.
- Landscape character of the areas through which the development passes, including the drumlin landscape to the north and the rolling and riverside landscape to the south.
- Identified landscape features, including a small number of scenic views and lakes, the Blackwater and Boyne River Valleys, the Boyne Valley Driving Route and the Monaghan Way,
- A small number of demesnes landscapes, including Brittas Estate.
- A small number of settlements/townlands, including Muff, Teltown/Gibstown/Donaghpatrick and Dunderry.

Notably impacts will occur in close vicinity to the proposed development, generally up to 600-800m, but up to 1km in areas that are particularly elevated or open. Cumulative impacts are also likely to occur, where it can be seen in conjunction with other infrastructure (notably wind farms and OHLs). However, impacts are likely to be only locally significant by virtue of the relatively modest visual presence of the proposed development. Wider cumulative impacts are unlikely to arise due to the absence of substantial inter-visibility with other existing or proposed development.

Having regard to the project's status as a strategic infrastructure project of national interest and the approach adopted by the applicant to minimise impacts on landscape and visual effects at route selection and detailed design stage, it is considered that the resultant residual landscape and visual impacts, referred to above, are acceptable.

6.2.3. Material Assets and Cultural Heritage

Material Assets – General

Direct and indirect impacts are likely to arise as a consequence of the construction and operational phases of the development as a result of the project's interaction with existing utilities, aviation development and from the generation of waste.

Having regard to the proposed mitigation measures, impacts on existing utilities are unlikely to be significant. Having regard to the relatively small volume of waste predicted to arise as a consequence of the development, the proposed means to dispose of this and subject to condition, it is considered that arrangements for the disposal of waste will not give rise to significant environmental effects.

Having regard to the advice of the IAA in respect of Trim Airfield and Irish Balloon Fights, and to the large area over which balloon flights occur in the area, it is considered that the proposed development would not pose an unacceptable risk to flights arriving and departing from the airfield at Trim or to balloon flights taking place in the vicinity of Trim. No significant impacts are predicted for Medivac operations in Ireland given the operation of the current service within the existing extensive network of overhead power lines.

Cumulative impacts on material assets (general), from the proposed development in conjunction with existing, planned or proposed developments, are not likely to arise.

Material Assets – Traffic

Direct and indirect impacts are likely to arise, primarily during the construction phase of the development, notably from construction traffic, off-loading on the public road and use of temporary access routes. Having regard to the linear nature of the proposed development, construction works at discrete and separate sites, the phased approach towards construction, the short duration of works at any one site and subject to implementation of the proposed mitigation measures, it is considered that the proposed development can be accommodated within the public road network, without significant impact (on road condition or traffic safety).

Issues arising in respect of off-loading on the public road can be adequately dealt with by condition. Any residual impacts will not be significant.

Having regard to the applicant's proposals to manage traffic movements at the interface of the temporary access routes and the public road and to mitigate impacts arising in respect of access routes, and subject to conditions in respect of stepping down construction equipment, it is considered that the proposed use of temporary access routes will not give rise to significant environmental effects.

Cumulative impacts on material assets (traffic), from the proposed development in conjunction with existing, planned or proposed developments, are not likely to arise.

Cultural Heritage

Archaeology – I accept that the route of the alignment has been designed to avoid direct impacts on the archaeological resource, including World Heritage Sites, sites included on the Tentative list (Tara, Kells), any Monuments in State care or the upstanding remains of any previously recorded monument.

It is accepted that the potential does exist for subsurface archaeology to be uncovered during construction resulting in direct physical impacts. Having regard

to standard mitigation measures proposed (archaeological testing, monitoring groundworks, and the demarcation of features under the supervision of a qualified archaeologist), I accept that this impact will be minimised.

During the operational stage the proposed overhead line has the potential to impact on the setting of monuments and structures. No monuments of international or national significance will be significantly impacted. Whilst the setting of c 7% of the recorded monuments will be impacts to varying degrees, I accept that these impacts cannot be mitigated. I accept that development will impact on the setting of TELTOWN Zone of Archaeological Amenity (ZAA) as a whole, but this has to be considered in the context of a significantly altered environment, which is no longer recognisable as a cohesive archaeological landscape.

Architecture – I accept that there will be no direct impacts on any building/structure included in the Record of Protected Structures or the National Inventory of Architectural Heritage. There is potential for limited impacts on the setting of a small number of listed buildings/structures, many of which are located in settlements or associated with demesnes and historic gardens.

The alignment will cross demesne landscapes and I accept that the level of impact on setting will vary depending on the overall integrity of the demesne and its associated features, and, the proximity and dominance of the line. The most significant impacts will occur in relation to Brittas, where a significant negative permanent impact on the demesne will occur.

Other sites of cultural significance - There are a number of other sites within the study area, which are of cultural significance to the local communities. The proposed development will not curtail the continuation of any events in these areas. Furthermore, with regard to the Gaeltacht, I do not accept that there is any evidence to suggest that the development will negatively impact on its survival.

I consider that it has been demonstrated that the impacts on the archaeological resource has been mitigated to the greatest possible extent. I accept that where

significant impacts arise, as for example in the case of Brittas, the level of impact must be balanced in terms of the wider public interest of improved electricity security and supply.

I accept that the proposed Castletownmoor windfarm, which has a smaller footprint than that the previously proposed Emlagh development is likely to have adverse cumulative impacts on the setting of Mountainstown House and demesne and the setting of Dowdstown House by virtue of its proximity to these and the proposed development.

6.2.4. Interactions between the foregoing

Impact Interactions

Whilst impact interactions, subject to mitigation, are unlikely to be significant, it is considered that it is likely that the proposed development has given and will give rise to significant interactive impacts on people living in proximity to the route as a consequence of the perceived impacts on health, land and property values and visual amenity.

6.2.5. Transboundary Impacts

Transboundary impacts likely to occur in Northern Ireland, as a consequence of the proposed development, are confined to landscape and visual effects and impacts on cultural heritage in the vicinity of Towers 102 to 110. Impacts are likely to be direct and indirect, and locally significant, with the development visible from a short section of the public road in Northern Ireland and impacting on the setting of an archaeological monument (an enclosure) in Northern Ireland.

The project as a whole (in Northern Ireland and this State) is likely to give rise to similar types of impacts in both jurisdictions. No significant additional impacts are likely to arise as a consequence of the project as a whole that have not already been identified.

6.2.6. Public Consultation

Having regard to:

- The extensive period during which the project has been in the public domain,
- The substantial public consultation exercise undertaken by the applicant, which has included at an early stage different technical solutions in respect of the development and the proposed methodology for constructing it, including the use of temporary access routes and an indication of likely routes,
- The resultant public interest in (and opposition to) the project,
- The wide range of matters raised during the course of the oral hearing, and
- The presentation of these now before the Board, and
- The capacity of the Board to consider all of the information in respect of the application, including alternatives,

It is considered that the applicant's approach to consultation meets with the statutory requirements of Article 6(4) of the EIA Directive.

6.3. Summary and Conclusion

Having regard to the above, it is my view that the significant environmental effects arising as a consequence of the development have been adequately identified and assessed.

7.0 Appropriate Assessment

7.1. Introduction

The EU Habitats Directive 92/43/EEC provides legal protection for habitats and species of European importance through the establishment of a network of designated conservation areas collectively referred to as Natura 2000 (or 'European') sites. The network includes sites designated as Special Areas of Conservation (SAC) under the EU Habitats Directive and Special Protection Areas (SPA) designated under the EU Birds Directive. In general terms, they are considered to be of exceptional importance for protecting rare, endangered or vulnerable habitats and species within the European Community.

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment must be undertaken for any plan or programme not directly connected with or necessary to the management of a European site but likely to have a significant effect on the site in view of its conservation objectives. The proposed development is not directly connected with or necessary to the management of a European site. A Natura Impact Statement (NIS) has been submitted with the application to address the likely or possible significant effects, if any, arising from the proposed development on any European site.

The NIS is contained in Volume 5 of the EIS. The location of the Natura 2000 sites is detailed in Figure 4.2 (CMSA) and Figure 4.3 (MSA) of the document. The NIS contains 3 no. appendices:

- Appendix A (Site Synopses),
- Appendix B (Whooper Swan Data 2007-2014) and
- Appendix C (Whooper Swan Tracking Data).

7.2. Screening for Appropriate Assessment

Whilst the NPWS recommends consideration of Natura 2000 sites within 15km of a study area, the NIS considers European sites within a 30 km radius, including relevant European sites in Northern Ireland, due to the presence of mobile species such as wintering birds. It also considered several SPA's located at distances

greater than 30km from the study area (i.e. Lough Oughter & Associated Loughs SPA, Lough Swilly SPA, Lough Foyle SPA and Lough Neagh and Lough Beg SPA) as Whooper Swan is a qualifying interest for these sites and migratory movements are known to occur between these sites.

Stage 1 Screening identified a total of 16 no. European sites, on which there is the possibility of a significant effect arising from the proposed development. These included 5 no. cSAC's and 11 no. SPA's. Table 4.2 of the NIS identifies each site, its qualifying interests and possible connections to the study area. The screening appraisal (Table 4.3) examined each site in the context of its proximity to the proposed development, its qualifying interests, the potential for significant effects arising from the development either alone and in combination with other projects, and whether the potential for significant effects could be ruled out.

I would also point out to the Board that a Supplementary Screening report is provided in EirGrid's response to the submissions. This was prepared in response to issues raised by the DAHG's regarding ex-situ impacts on migratory bird species associated with SPA's to the east and south-east of the country including Wexford Harbour & Slobs SPA. It is considered in more detail below.

7.2.1. Results of Screening of cSAC and SPA sites

The five cSAC's considered were:

- River Boyne and River Blackwater cSAC.
- Killyconny Bog cSAC
- Rye Water & Carton cSAC
- Boyne Coast & Estuary cSAC
- Dundalk Bay cSAC

With the exception of the River Boyne and Blackwater SAC, potential significant effects arising from the proposed development, whether alone or in combination with other plans or projects, could be ruled out on the remaining SAC's. Two of the sites were screened out on the basis that they were located outside the zone of influence of any effects of the development and due to lack of hydrological

connectivity. Whilst there are hydrological links with two other cSACs (Dundalk Bay, Boyne Coast & Estuary), the potential for impacts on these sites and their qualifying interests were eliminated due to the highly localised nature of potential water quality issues associated with the proposed development and the significant separation distance (c. 28km) to the European site. I accept that this is reasonable.

The eleven SPA's sites considered included:

- River Boyne and River Blackwater SPA
- Strabannan-Braganstown SPA
- Boyne Coast & Estuary SPA
- Dundalk Bay SPA
- Slieve Beagh SPA
- Lough Oughter & Associated Loughs SPA
- Upper Lough Erne SPA
- Slieve Beagh-Mullaghfad-Lisnaskee SPA
- Lough Neagh & Lough Beg SPA
- Lough Foyle SPA
- Lough Swilly SPA

Three of the SPA's were screened out (Strabannan-Braganstown SPA, Boyne Coast & Estuary SPA and Slieve Beagh SPA), due to distance and the lack of connectivity between species common to both the study area and the SPA. The remaining 8 sites were brought forward for Appropriate Assessment on the grounds of potential disturbance during construction/maintenance activities to qualifying species such as Kingfisher, and potential connections between the study area and other SPA sites of significance, for species of conservation interest including Whooper Swan and Great Crested Glebe.

7.2.2. Supplementary Screening Report

The DAHG requested that other SPA sites be screened for potential ex-situ impacts on migratory species. This involved a supplementary screening for

Appropriate Assessment, which is contained in EirGrid's response to the submissions. It focuses on those bird species overwintering in Ireland whose migration involves potential movements across Ireland i.e. Light-bellied Brent Geese, Bewick Swan, Greylag Geese, Greenland White-fronted Geese and Whooper Swan. It is confined to sites in the east and south east of the country as requested by the DAHG. The sites are located between 40km to 115km from the study area.

I draw the attention of the Board to Table 12.1 of EirGrid's response. It details the location of the SPA sites, the distance from the proposed development, the qualifying interests (i.e. geese or swans) and consideration of potential ex-situ impacts. The sites include those in and around Dublin Bay extending southwards to include Wexford Harbour & Slobs and other remote sites.
The Appropriate Assessment Screening concludes that there is no possibility of significant effects arising from the proposed development that would impact significantly on the qualifying interests (migratory geese and swan) of the European sites considered at a distance from the site. This is based on the following;

Light-bellied Brent Goose is a qualifying feature for many of the sites in and around Dublin Bay and at more remote sites including Rogerstown Estuary, The Murrough Estuary and Ballyteigue Burrow SPA located c.150 km to the south east. The species was not recorded during any flight line surveys or monthly I-Webs surveys in the study area between 2007-2015. It is typically a coastal species. Observed flight heights during migration are typically well above the towers and conductors (2,500-3,000m over land). It is noted that Brent Geese migrate in the context of the existing wirescape, to which the proposed powerline will not add significantly. There are no reports of mass casualties associated with existing infrastructure. I accept that due to limited connectivity between the study area and the SPA, significant impacts are not likely to arise which would impact on populations and the qualifying feature of the SPA's.

Bewick Swan is a qualifying feature for Tacumshin Lake SPA, which is located c.150km from the site. It is described as a scarce wintering species which fly in

from Siberia across Europe on a flight path that avoids the alignment. Having regard to the significant distance between the SPA and the study area, I accept that there is no possibility of significant impacts on the SPA for which the species is selected.

Greylag Goose is a qualifying interest for a number of SPA's including Rogerstown Estuary SPA, Poulaphuca Reservoir SPA and The Murragh SPA. These sites occur at distances of 40-60km from the site of the proposed development. The species was only sporadically recorded with a maximum of one observation in a given year in the study area. There is no possibility of significant effects on the SPA's selected for the species for the following reasons;

- No appreciable connection between the area of the proposed development and the SPA's considered for Greylag Goose.
- Very low numbers and no flight lines recorded in the study area
- Irregular occurrence and distribution of Greylag Geese
- Avoidance rates by geese of similar risk infrastructure i.e. windfarms (Scottish Natural Heritage, 2013).

Greenland White-fronted Goose is a qualifying feature for more remote sites including Cahore Marshes SPA, The Raven SPA and Wexford Harbour and Slobs SPA. The species was not observed flying through or using the study area. The studies were conducted (April-October) when geese could potentially migrate across the study area. Observations of migratory geese confirm a north-westerly migratory route that avoids the study area and at heights that overflies overhead line infrastructure. I accept on the basis of the information provided, the significant distance to the SPA's and the lack of appreciable connection with the SPA, there is no possibility of significant impacts on the SPA sites, for which the species is selected.

Whooper Swan is a qualifying feature for both Wexford Harbour & Slobs and Tacumshin Lake, located 130km and 150km respectively from the proposed development. Tracking (satellite) records available for Whooper Swan on the

WWT website and also described in Griffin et al (2010[98]) and Griffin et al (2011)[99] were examined (as described in the NIS) and there is no indication that there are flight lines (migratory or national) between the study area and the SPA's.

None of the SPA sites considered in the supplementary screening report were brought forward for Appropriate Assessment on the grounds that there is no possibility of significant effects arising from the proposed development that would impact significantly on the qualifying interests (migratory geese and swans) of the European sites to the east and south east .This is considered reasonable on the basis of distance and the absence of connectivity between species that are common to both the study area and the relevant SPA's.

7.2.3. Conclusion on Stage I Screening

It is reasonable to conclude that on the basis of the information on the file, which I consider adequate in order to issue a screening determination, that the proposed development, either individually or in combination with other plans or projects would not be likely to have a significant effect on the following European sites, in view of the sites' conservation Objectives and that a Stage 2 Appropriate Assessment is not required in respect of these sites.

- Killyconny Bog cSAC
- Rye Water & Carton cSAC
- Boyne Coast & Estuary cSAC
- Dundalk Bay cSAC
- Strabannan-Braganstown SPA
- Boyne Coast & Estuary SPA
- Slieve Beagh SPA, and

The ex-situ sites considered in the Supplementary Screening Report

7.3. <u>Stage 2 Appropriate Assessment</u>

[98] Griffin L Rees, E&B Hughes (2010). Whooper Swan *Cygnus Cygnus* migration in relation to offshore wind farm Footprints Final Report to DECC

[99] Griffin L Rees, E&B Hughes (2011). Migration routes of Whooper Swans and geese in relation to windfarm footprints.

It was concluded from Stage 1 Screening that it was not possible to rule out significant effects on the conservation objectives of a total of eight European sites, either alone or in combination with other developments, without employing mitigation measures. These sites were therefore brought forward for Appropriate Assessment and the potential impacts (direct /indirect and in-combination effects) of the development on each of the sites concerned was examined in light of the site's conservation objectives.

The sites include the following:

- River Boyne and River Blackwater cSAC
- River Boyne and River Blackwater SPA.
- Upper Lough Erne SPA.
- Lough Oughter & Associated Loughs SPA.
- Lough Neagh and Lough Beg SPA.
- Lough Swilly SPA.
- Lough Foyle SPA.
- Dundalk Bay SPA.

The River Boyne and River Blackwater cSAC & SPA traverses the study area. The other European sites are located at remote distances from the site. The sites are considered below.

7.3.1. Potential Impacts on River Boyne and River Blackwater SAC& SPA and Mitigation

The River Boyne and River Blackwater cSAC *(Site Code 002299)* is selected for a number of habitats and/or species listed in Annex 1 and Annex 11 of the EU Habitats Directive including Alkaline fens, Alluvial forests, River Lamprey Salmon and Otter.

Site specific Conservation Objectives are not yet available for the site. The generic conservation objective is:

'To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or Annex 11 species for which the site has been selected'

The River Boyne and Blackwater SPA (Site Code 004232) is of high ornithological importance as it supports a national important population of Kingfisher, a species that is listed on Annex 1 of the EU Birds Directive. The site is a site of special conservation interest for Kingfisher.

Site specific Conservation Objectives are not yet available for the site. The generic conservation objective is:

'*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the SPA'.*

The boundaries of the River Boyne and River Blackwater SAC and SPA overlap to a large degree but the SAC boundary extends beyond the river channel to include riparian habitats. It traverses the southern section of the study area (within the MSA) and is crossed by the alignment (Fig 5.1 & 5.2 NIS).

No part of the development encroaches into the cSAC or the SPA site, but the development oversails two stretches. This necessitates the construction of support towers at either side of the river channels but outside the boundaries of the cSAC/SPA. It was confirmed during the oral hearing that there is no requirement to access the SAC/SPA boundaries for any aspect of the development. Consequently, there will be no loss, fragmentation or interference with habitats that are qualifying interests of the SAC (alkaline fen, alluvial forests). Furthermore, there is no tree cutting or bankside disturbance associated with these river crossings and the works will not encroach onto the riparian zone. The potential for disturbance to breeding Otter and Kingfisher (qualifying interests of the SAC/SPA) at these crossing points is, therefore, avoided.

The potential for significant effects on water quality have been identified arising from the construction of the towers on either side of the river channel adjacent to the River Boyne and its tributaries. These works would have the potential, in the

absence of mitigation, to increase siltation load /pollution events which could result in temporary effects on the species/habitats for which the site is designated.

To reduce the potential for adverse effects on water quality during construction and impacts on the qualifying features for the River Boyne and River Blackwater SAC (Salmon and River Lamprey) standard mitigation measures, as documented in earlier sections of this report, will be implemented. Sediment and pollution control measures will be undertaken in all work areas located near drains and /or watercourses within the catchment of European sites. Subject to the implementation of these best practice measures, no significant impacts will arise.

Sections of the alignment will also oversail non-designated rivers that flow into the River Boyne and River Blackwater cSAC. Whilst all towers will be removed from the riparian zones, each of the rivers have been identified as potential breeding sites for mobile qualifying interests (Kingfisher and Otter). The potential exists for impacts on these species associated with tree cutting and bankside disturbance.

Confirmatory pre-construction surveys will be undertaken at watercourses linked to the River Boyne and River Blackwater cSAC, where tree felling may lead to potential disturbance of Kingfisher and Otter breeding sites. Should tree cutting be required at a breeding site, the work will only take place outside the breeding season. Tree cutting will be advanced in a manner that does not damage the breeding site/river bank through careful pollarding of tree limbs and retention of tree root structures and lower vegetation under which the species usually breeds. Water quality protection measures will also be implemented to protect qualifying features downstream (Salmon, River Lamprey).
Subject to the implementation of these measures, I accept that there is no potential for significant impacts on the qualifying interests for which the site is selected.

Operational impacts may arise from occasional tree trimming in riparian areas, maintenance activity associated with OHL etc. During the operational stages of the development, standard water pollution protection measures will be

implemented during times of maintenance of the overhead line where such works are undertaken in the vicinity of the River Boyne and River Blackwater SAC/SPA. In circumstances where such measures are effectively implemented there will be no adverse impacts on the integrity of the European site, or its qualifying interests.

7.3.2. Potential Impacts on other remote European sites

The remaining European sites are all SPA'S and with the exception of Dundalk Bay, are located to the north east/ northwest of the alignment. All of the SPA's are located at significant distances ranging from 27km to 100km.[100] The sites are considered due to the potential for bird exchange between the SPA's and study area. Each of the SPA's support internationally importance numbers of such as Whooper Swan, Great Crested Grebe etc., with the potential to be impacted by the proposed development. The Whooper Swan was identified as a key species due to its extensive use of the study area, its susceptibility to collision with powerlines and because it is a qualifying interest for five of the SPA's (Lough Erne, Lough Oughter & Associated Loughs, Lough Neagh & Lough Beg, Lough Swilly & Lough Foyle). Potential impacts to the wintering Great Crested Grebe populations of Dundalk Bay SPA were also considered, as the species is known to breed in the study area.

It is acknowledged in the NIS that a proportion of the swans that winter in the study area may make landfall at staging sites in more remote SPA's. If local populations in the study area were to be significantly affected by the proposed development (arising from collision), there could be consequences for SPA populations in other remote sites. The NIS, therefore, considers impacts on Whooper Swan at a local scale before consideration of potential impacts on remote SPA sites.

[100] These sites are in addition to those considered in the Supplementary Screening Report which focus on the east and south east of the country.

7.3.2.1. Local Populations

Surveys of Whopper Swan and other wintering birds in the study area were undertaken on a monthly basis (October to April) over a seven-year period (additional survey data for 2014-2015 made available during the oral hearing). The surveys provided information on the locations (roosting/foraging sites) used by Whooper swan, local concentrations and where regular/irregular flight lines occur across the alignment.

The studies carried out indicate that Whooper swan in the study area tend to locate for extended periods (weeks) in relatively distinct areas, all of which are well removed from European sites. They concentrate generally at lake sites which provide both roosting and foraging opportunities, without the requirement for extensive daily flights. The surveys indicated that the daily flight lines of these locally occurring flocks in the study area do not extent beyond approximately 15km and most flight lines are much less than that. However, it is accepted (and this has been discussed under Flora and Fauna) that both regular and irregular flight lines do occur across the alignment which pose a collision risk to Whooper Swan. It is proposed to mitigate these effects using bird flight diverters, as already discussed under Flora & Fauna.

7.3.2.2. Remote SPA populations

There is also potential for Whooper Swan exchange (albeit limited) between the study area and the more remote SPA sites, for which the Whooper swan is a qualifying interest. Five of the SPA's are brought forward for Appropriate Assessment on the basis of potential impacts on Whooper Swan (Lough Erne, Lough Oughter & Associated Loughs, Lough Neagh & Lough Beg, Lough Swilly & Lough Foyle). Dundalk Bay SPA is considered for Great Crested Grebe. The sites are described in detail in the NIS, to which I draw the attention of the Board.

All five sites support internationally important populations of Whooper Swan. I note that no ringed birds from any of the SPA's were recorded in the study area during the extensive surveys carried out in the area (Appendix C of EirGrid's response).

There is no indication that there are flight lines between the remote SPA 's sites and the local populations within the study area, or, that migratory flight lines cross the route of the proposed alignment. The Whooper swan populations associated with the study areas are considered to be a separate population from those of the remote SPA's, which range in distance from 27km to 100km.

7.3.2.3. Movements between SPA sites

In terms of movement of swans between SPA's, it is acknowledged that should this occur between Lough Oughter and Lough Neagh it would have the potential to cross the Northern Ireland section of the alignment and accordingly is considered below under potential in-combination effects. It is also noted that there is a high level of exchange between flocks in Lough Swilly and Lough Foyle as the complex is used as both a staging and wintering area. Migratory routes crossing the Lough Swilly/Lough Foyle complex to Lough Neagh and the UK were recorded as were return migrations in spring. None of these migrations cross the alignment.

It is acknowledged in the NIS that there may be occasional flight lines that potentially cross the alignment during spring migration from the study area towards 'staging' sites at Upper Lough Erne SPA, Lough Neagh & Lough Beg SPA and potentially during winter migration from Lough Swilly and Lough Foyle towards the eastern part of the study area. Whilst it is stated in the NIS that 'most of these movements are likely to be sub-parallel with low potential for collision' the tracking data that is available (Appendix C) indicates that most flights do not appear to cross the alignment.

7.3.2.4. Impacts on Whopper Swan populations

Issues were raised by the DAHG regarding the potential impact of collision on the conservation status of Whooper Swan, which may impact on populations and their conservation status in SPA's remote from the site. The issue of collision risk draw is addressed in the Flora Fauna section of this report. The Board will note that the updated information presented to the oral hearing, indicates that while the potential for collision exists, there will be no population level impact on either county or national populations of Whooper Swan. As such, the mortality arising

from potential collisions with the proposed alignment will not affect the conservation status or integrity of any of these remote SPA's or their conservation objectives as they relate to Whooper Swan.

7.3.2.5. Mitigation

I am satisfied on the basis of the information presented that the potential for ex-situ impacts on SPA's remote from the site, for which Whooper Swan is a qualifying feature, are negligible. I consider that it has been demonstrated through the extensive bird surveys carried over a period of eight years that movements within the area are largely associated with local populations moving between foraging and roosting sites, with no evidence of species occurring from more remote SPA'S.

7.3.2.6. Dundalk Bay SPA

The NIS acknowledges that there is a limited possibility that Great Crested Grebe breeding in the study area may over winter in Dundalk Bay SPA. The surveys revealed 8 no. sites supporting breeding Great Crested in the CMSA during the 2013-2014 winter period. Five of these sites were west of the alignment and accordingly the alignment is potentially crossed by the species moving to/from this SPA site. Each of the sites supported just one pair of Great Crested Grebe, resulting in potentially a maximum of 10 birds crossing the alignment on occasional migratory flights. Within the MSA breeding Great Crested Grebe was recorded at 4 sites, three of which were east of the alignment, with the remaining site west of the alignment, supporting just one pair of birds.

Great Crested Grebe is considered a high collision risk species. Numbers of the species within the SPA have fluctuated widely, halving or doubling between months (NPWS, 2011). The conservation status of the species in Dundalk Bay is currently considered moderately unfavourable. No flight lines were recorded crossing the alignment during field studies and ringed birds were not recorded.

It is estimated that in a worst case scenario a collision risk of 1% may arise (based on the rationale used for Whooper Swan). Having regard to the low occurrence of

the species in the study area, and the low predicted mortality rate associated with collision, I accept that there will be no adverse impacts on the conservation status of the qualifying species of the SPA.

7.3.3. Potential In-Combination Effects

Plans/projects in the area which may result in potential combination effects are considered in section 5.2.7 of the NIS. These include the section of the proposed interconnector located in Northern Ireland (SONI proposal), windfarm developments and crossing of existing distribution and telecommunication lines.

7.3.3.1. SONI proposal

The SONI proposal relates to the section of overhead transmission line and associated infrastructure located within the jurisdiction of Northern Ireland. The potential impacts (without mitigation) on European sites are identified in the relevant documentation pertaining to the project. Cumulative and in-combination effects arising from the SONI proposal and its extension into Ireland are largely restricted to a potential to increase collision mortality of Whooper Swan (a designated feature of the assessed sites) during the operational stage of the development.

However, migratory movements for both the SONI proposal and the proposed development have been identified as occurring primarily parallel to the proposed interconnector development, with only limited potential for crossing the SONI proposal en route to and from Lough Neagh. As key flight lines identified relative to the proposed development are associated with local populations and have been mitigated for with flight diverters, no significant cumulative effects on the Whooper Swan populations are anticipated.

Mitigation measures incorporated into the design of the proposed development include the installation of bird flight diverters on the earth wire between towers 1-13 and 30-43 in Northern Ireland, post construction monitoring for collision casualties and the modification to deflector type and location arising from monitored observations.

I accept that there is no potential for significant impacts to the Whooper Swan populations of the European Sites considered, arising from the SONI proposal, along or in combination with other plans/projects, including the proposed North-South Interconnector.

7.3.3.2. Windfarm developments

There are a number of windfarms either approved or proposed in the area. These include:

- Lisduff Wind Farm (PA 10485 etc.) comprises 8 wind turbines and lies c.1km to the west of the proposed development (Towers 155-160).
- Raragh Wind Farm (PL236608) comprises 7 turbines and lies c.2km to the east of the proposed development (Tower 220).
- Teevurcher Wind Farm (PA 120679) comprises five wind turbines lies c.2.4km to the west of the proposed overhead line (Tower 234) and to the east of the village of Teevurcher, Co. Meath (Figure 10.1, Vol. 3B).
- Castletownmoor Wind Farm (PA0046) - Submitted to the Board in August 2016. It comprises the development of 25 wind turbines in clusters on land to the west of the R162, between the N52 and Wilkinstown in County Meath. Turbines are proposed on land in close proximity to the alignment, mostly to the west of it, but with a smaller number of turbines to the east of the proposed OHL. (The development is similar to, but smaller than, that refused by the Board under PA0038 (Emlagh).
- Maighne Wind Farm(PA0041) was refused by the Board on the 12th October 2016.

The residual impacts for these projects were reviewed as part of the assessment in the EIS. Due to the mitigation measures proposed for these projects, no significant residual impacts are predicted for shared ecological receptors, such as Whooper Swan. On the basis of the information available and the mitigation measures proposed as part of the proposed development, I consider that the potential for cumulative impacts does not arise.

The NIS also focuses on the in-combination effects associated with the additional potential pollution load to the River Boyne and River Blackwater SAC and SPA arising from construction activity associated with these windfarms. I note that water quality protection measures during the construction stage are identified as a key consideration in these projects. Subject to appropriate mitigation to protect water quality, I accept that no significant cumulative effects will arise to relevant qualifying interests from the proposed development in combination with the permitted and proposed developments.

7.3.3.3. Existing distribution line /telecommunication line crossings

The proposed development will cross other transmission, distribution and telecommunications lines. There are 59 no. roadside locations where the proposed 400kV route crosses existing OHL telecommunications lines. A total of 7 of these lines are located along roadsides within 500m of designated rivers or non-designated tributaries. However, due to the nature and scale of these works no significant cumulative effects will arise.

Electricity distribution lines will be undergrounded at 11 no. identified crossing points. There is potential for localised water quality in-combination effects to arise at one location in the vicinity of Tower 313 where a 10 kV cable is being undergrounded in the vicinity of a tributary of the River Boyne. Subject to the measures to protect water quality, I accept that cumulative impacts will not arise.

7.4. Conclusion

A number of issues were raised in the submissions and during the oral hearing regarding impacts on European Sites, qualifying features, including those raised by the DAHG regarding ex-situ impacts on Whooper Swan. These matters have been addressed above.

The Natura Impact Statement assesses the likely significant impacts arising from the proposed development on the integrity of the relevant European sites. There will be no direct impact on any Natura 2000 site arising from the proposed development.

The primary focus is on the River Boyne and River Blackwater SAC/SPA which is traversed by the alignment and other remote SPA sites for which Whooper Swan/Great Crested Grebe is a qualifying interest.

The potential for significant effects on the River Boyne and River Blackwater SAC and SPA is largely restricted to the construction stage. Detailed mitigation measures have been developed to prevent and ameliorate these impacts. Subject to the implementation of these measures, I do not consider that any element of the development either alone or in combination with other plans or projects will adversely affect the integrity of the European site in view of its conservation objectives.

The operational phase of the development has the potential to impact on Whooper Swan which is a qualifying interest for a number of SPAs, which are remote from the site. Having regard to the separation distance and lack of appreciable connection between the study areas and the SPA's, I accept that there will be no significant effects on any Natura 2000 site, which are selected for Whooper Swan, by the proposed development, either alone, or in combination with other plans or projects.

I accept that there will be no significant effects on Dundalk Bay SPA which is selected for Great Crested Grebe, by the proposed development, either alone, or in combination with other plans or projects.

The tests for Appropriate Assessment are based on dispelling reasonable scientific doubt regarding potential effects on the integrity of a European site. It requires a judgement to be made on the basis of the information available. In this regard, I wish to draw the attention of the Board to the following. It was confirmed during the oral hearing that there is no centralised data base for collision data, no monitoring of mortality rates and no firm indicators of bird flight paths and flight lines across Ireland or migration patterns. This limits the information that is available both to the applicant to the Board.

It has been demonstrated in the NIS, that field observations in both Ireland, N. Ireland, Scotland etc., that Whooper Swans continue to concentrate in areas where transmission and distribution line infrastructure cross national or county important sites (e.g. Toome Bridge). It is also noted that notwithstanding the already extensive transmission and distribution line infrastructure, the Icelandic Whooper Swan population which winters in Ireland is considered to be at favourable conservation status and populations have increased between 2000-2010.

I also accept that Whooper Swan migrate across the country and notwithstanding the already extensive transmission and distribution line infrastructure that they may potentially collide with, no evidence was produced to suggest significant numbers of casualties of the species as a result of collision with powerlines.

On the basis of the best available scientific information, I consider that it can be concluded with reasonable certainty that the proposed development would not adversely affect the favourable conservation status of Whooper Swan. No specific mitigation is required other than that proposed for local populations.

I consider, therefore, that it is reasonable to conclude on the basis of the information on the file, which I consider is adequate to carry out Stage 2

Appropriate Assessment, that the proposed development, individually or in combination with other plans or projects would not adversely affect the integrity of any European site, in particular the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA with site codes 002299 and 004232 respectively, in view of the site's conservation objectives.

8.0 CONCLUSION AND RECOMMENDATION

8.1. Conclusion and Recommendation

Whilst it is recognised that the proposed development will result in a limited number of localised impacts, having regard to the identified strategic need for the development, the routing and detailed design of the alignment to avoid environmental constraints, it is considered that subject to compliance with the mitigation measures set out in the EIS, the NIS and the response document and the conditions set out below, the proposed development would be in accordance with the proper planning and sustainable development of the area. Acccordingly I recommend that approval for the development be granted, subject to the conditions set out below.

8.2. Reasons and Considerations

Having regard to:

a) the designation as a Project of Common Interest (PCI),
b) the provisions of the National Spatial Strategy for Ireland 2002-2020, which seeks to strengthen energy networks in the regions,
c) the provisions of the Government White Paper 'Ireland's Transition to a Low Carbon Energy Future 2015-2030',
d) the provisions of the 'Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure' (2012),
e) the provisions of EirGrid's grid development strategy 'Your Grid, Your Views, Your Tomorrow' (2015)
f) the provisions of Grid 25, EirGrid's transmission network development strategy,
g) the provisions of the Border Regional Authority Planning Guidelines 2010-2022; and the provisions of the Regional Planning Guidelines for the Greater Dublin Area 2010-2022,
h) the provisions of the Monaghan County Development Plan 2013-2019; the provisions of the Cavan County Development Plan 2014-2020 and the provisions of the Meath County Development Plan 2013-2019,

i) the strategic importance of the proposed interconnector as part of the all-island transmission network and the need for reliability and security of supply in terms of the all-island electricity market,
j) the community need, public interest served and the overall benefits to be achieved from the proposed development,
k) all documentation on file including; the Environmental Impact Statement; the Natura Impact Statement; the Joint Environmental Report; and the submissions and observations made in respect of the application, including at the oral hearing,
l) the routing of the proposed development to avoid the most sensitive receptors.

It is considered that;

- the proposed development supports the core objectives of European and national energy policy of sustainability, security of supply and competitiveness.
- will remove existing restrictions that limit cross border electricity flows between Ireland and Northern Ireland, which will enhance security of supply and facilitate the more efficient operation of the single electricity market on an all-island basis and a wider integrated European electricity network,
- facilitate greater penetration of renewables allowing both Ireland and Northern Ireland to meet legally binding greenhouse gas emission targets.
- provide benefits to the economies of both jurisdictions and for individual consumers.

Having considered alternative transmission technologies and notwithstanding the advancement in technology, it is considered and that it has been demonstrated that a 400 kV overhead line is the most appropriate and cost effective solution to satisfy the current requirements of the proposed North-South Interconnector development.

Whilst the landscape and visual impacts of the development, and the possibility of localised impacts on property values, are acknowledged, having regard to the

demonstrated strategic need for the development, the approach taken by the applicant in terms of route selection and the detailed design of the development, which has sought to minimise landscape and visual effects, it is considered that the residual impacts which occur only in close proximity to the development are acceptable.

It is considered that the EIS and supporting documentation:

- Describes the project and provides information on the site, the design of the proposed development and size of the project,
- Describes the measures envisaged to avoid, reduce, and if possible, remedy significant adverse effects,
- Provides sufficient data to identify and assess the main effects which the project is likely to have on the environment,
- Provides a description of the main alternatives studied by the developer an indication of the main reasons for the choice of alternative put forward, taking into account environmental effects, and
- Includes a non-technical summary of the above information.

I have completed an environmental impact assessment in relation to the subject development, by itself and cumulatively with other development in the vicinity and which has also included consideration of all written and oral submissions received, and conclude as follows. The proposed development

- would not seriously injure the amenities of, or properties in, the wider area through which it is routed,
- would not result in significant visual or landscape impacts in the wider area through which it is routed,
- would not seriously injure the ecology of the area, including bird life, protected species and habitats, and areas designated for environmental protection,
- would not adversely affect the hydrology or hydrogeology of the area,
- would not give rise to, or, exacerbate flooding,
- would not seriously detract from the character or setting of significant features of architectural or archaeological heritage,
- would not be prejudicial to public health,

- would be acceptable in terms of traffic safety and convenience, and
- would not result in significant trans-boundary impacts.

Having considered the NIS and the Supplementary Screening Report contained in applicant's response document and all relevant written and oral submissions recieved, I conclude that the proposed development, by itself, or in combination with other plans or projects, would not adversely affect the integrity of any European Site, in view of the sites' conservation objectives.

It is considered that subject to compliance with the mitigation measures set out in the application documentation which includes the Environmental Impact Statement, the Natura Impact Statement, and the applicant's submission to the Board of 19th of October 2015, and subject to compliance with the conditions set out below the proposed development would be in accordance with the proper planning and sustainable of the area.

CONDITIONS

1. The proposed development shall be carried out and completed in accordance with the plans and particulars, lodged with the Board on the 9th day of June, 2015 and the submission lodged to with An Bord Pleanála on the19th day of October, 2016, except as may otherwise be required in order to comply with the following conditions. In particular, the mitigation measures identified in the environmental impact statement, the natura impact statement and applicant's response document shall be implemented in full by the developer. Where the conditions require details to be agreed with the planning authority, the developer shall agree such details in writing with the planning authority prior to commencement of development and the development shall be carried out and completed in accordance with the agreed particulars.

Reason: In the interest of clarity.

2. Prior to the commencement of development details of (i) the external appearance of the construction materials storage yard and (ii) and the restoration of the site to include a time scale for implementation shall be submitted to, and agreed with the relevant planning authority.

Reason: In the interest of visual amenity.

3. Prior to the commencement of development, details of Community Gain to facilitate off-site landscaping (subject to the agreement of the landowner), to address landscape and visual impacts arising as a consequence of the development, shall be submitted to the relevant planning authority for written approval. These shall include arrangements for the administration of the funds.

Reason: In the interest of visual amenity.

4. Prior to the commencement of development, an Agricultural Liaison Officer shall be appointed and shall be responsible for liaison with landowners (i) prior to and during the construction phase of the project, to identify and address issues of concern to individual landowners including disease protocols if relevant, in accordance with the measures set out in the application for approval, and (ii) thereafter for the operational phase of the development.

Reason: To ensure the satisfactory completion and operation of the development in the context of agricultural activities.

5. Prior to the commencement of development, a construction management plan, a traffic management plan and waste management plan shall be submitted to, and agreed in writing with, the relevant planning authority following consultations with relevant statutory agencies, including Inland Fisheries Ireland and the Department of Arts, Heritage and the Gaeltacht and Irish Water. This plan shall incorporate the mitigation measures indicated in the environmental impact

statement, and any others deemed necessary, and shall provide details of intended construction practice for the proposed development, including:

(a) details of appropriate geophysical survey in respect of construction sites and access routes in the vicinity of Towers 103 to 118 shall be submitted to and agreed in writing with the relevant planning authority.
(b) volume of spoil arising from each tower site, the proposed means to dispose of waste, haul routes to be utilised and detailed measures to demonstrate compliance with the relevant regional waste management plan.
(c) site specific arrangements for each temporary access route, to include, where necessary:
    (i) arrangements for stepping down vehicle size,
    (ii) arrangements for off-loading of materials,
    (iii) short term road closures,
    (iv) the phasing of construction works which are accessed by single lane carriageways.
    (v) the arrangements for the transfer and management of concrete, including wash out facilities.
(d) Arrangement for pre and post construction road survey. The pre-construction road survey shall be completed three months prior to the commencement of the development,
(e) Details of the location and proposed water monitoring protocols in respect of surface water bodies,
(f) Details of monitoring of water levels and water quality in wells within 100m of the proposed alignment,
(g) Details regarding pre and post construction monitoring of buildings which lie in proximity to proposed access routes, if required by landowners.
(h) Means to control dust at construction sites.
(i) Details of a formal complaints procedure to resolve any issues or community concerns.

Monitoring of the construction phase of the development shall be carried out by a suitably qualified person to ensure that all mitigation measures contained in the environmental impact statement and response document are implemented. A record of daily checks that works are being undertaken in accordance with the construction management plan shall be available for inspection by the relevant planning authority. Monitoring reports shall be submitted to the relevant planning authority and other relevant statutory bodies in accordance with the requirements of the relevant planning authority.

Reason: In the interest of protecting the amenities of the area, sustainable waste management, preventing pollution of surface waters, protection of existing habitats and traffic safety.

6. Prior to the commencement of development the developer shall agree with the relevant planning authorities, in conjunction with the National Parks and Wildlife Service, a protocol for confirmatory surveys. In the event of these surveys identifying species of conservation interest, measures for their protection shall be incorporated into the construction management plan.

Reason: In the interest of protecting the habitats of a protected species.

7. The developer shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site. In this regard, the developer shall:
(a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development, and
(b) employ a suitably-qualified archaeologist prior to the commencement of development. The archaeologist shall assess the site and monitor all site development works.

The assessment shall address the following issues:

(i) the nature and location of archaeological material on the site, and
(ii) the impact of the proposed development on such archaeological material.

A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the developer shall agree in writing with the planning authority details regarding any further archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination.

Reason: In order to conserve the archaeological heritage of the area and to secure the preservation (in-situ or by record) and protection of any archaeological remains that may exist within the site.

8. Prior to commencement of development, the developer shall agree a monitoring programme for Whooper Swan, with the relevant planning authority, in conjunction with the National Parks and Wildlife Service. The monitoring programme shall include details of flight activity, spatial and temporal shifts in bird abundance, protocols for mortality surveys at high risk areas to assess the number of fatalities arising from collision (with corrections made for scavenger removal, searcher detection bias, details of additional mitigation if required etc.). The location and frequency of the monitoring programme shall be as agree with National Park and Wildlife.

   Reason: To ensure appropriate monitoring of the impact of the development on Whooper Swan.

9. All road surfaces, culverts, watercourses, verges and public lands shall be protected during construction and, in the case of any damage occurring, shall be reinstated to the satisfaction of the relevant planning authority. Details in this regard, to include pre and post construction survey, shall be agreed with the relevant planning authority prior to commencement of development.

   Reason: In order to ensure a satisfactory standard of development.

10. Prior to the commencement of development, the undertaker shall lodge with the relevant planning authority a cash deposit, a bond of an insurance company, or other security to secure the satisfactory reinstatement of all public roads damaged as a result of activities related to construction of the proposed development, coupled with an agreement empowering the relevant planning authority to apply such security or part thereof to the reinstatement of such roads. The form and amount of the security shall be as agreed between the relevant planning authority and the undertaker or, in default of agreement the details shall be referred to An Bord Pleanála for determination.

    Reason: To ensure a satisfactory reinstatement of the road network.

Breda Gannon

Senior Planning Inspector

14th November 2016