Appendix 8.1:

Information to Inform Habitats Regulations Assessment

SONI
Tyrone Cavan Interconnector
The current. The future.

Tyrone – Cavan Interconnector Information to Inform Habitats Regulations Assessment

Table of Contents

1 Introduction

The System Operator for Northern Ireland (SONI) is seeking consent from the Northern Ireland Department of the Environment (DoE) for a 400,000 volt (400kV) overhead line in Counties Tyrone and Armagh and an associated 275/400kV substation. The overhead line will run from the townland of Turleenan (near Moy), County Tyrone for a distance of approximately 34 km to the Republic of Ireland (RoI) border, crossing at a position between the townland of "Doohat or Crossreagh", County Armagh, and Lemgare, County Monaghan. There would also be a 200m oversail section in the Northern Ireland townland of Crossbane. The overhead line, the substation and associated development (including temporary access tracks and other works required to facilitate construction) are referred to as the "Tyrone – Cavan Interconnector".

Planning permission is being sought for the Tyrone – Cavan Interconnector within Northern Ireland. The Tyrone – Cavan Interconnector has been formally submitted to DOE as two planning applications – the original application (O/2009/0792/F) and the associated works application (O/2013/0214/F).

Because of the location and nature of the Tyrone – Cavan Interconnector, an assessment is required under The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) of the potential impacts to European protected sites (Natura 2000 sites). These sites are Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Ramsar sites are also included in the HRA process as a matter of policy[1] and are afforded the same level of protection as SPAs / SACs. The Regulations enact the European Commission Habitats Directive (92/43/EEC) of the possible impact on European protected sites and Directive 2009/147/EC on the Conservation of Wild Birds (codified version of Council Directive 79/409/EEC (as amended) on the Conservation of Wild Birds).

In 2013, as part of the planning applications for the Tyrone – Cavan Interconnector, SONI (then NIE) prepared a draft/shadow Stage 1 Habitats Regulations Assessment screening report (Appendix 10h Consolidated ES). The draft Stage 1 screening assessment report was intended to provide information on the Tyrone – Cavan Interconnector to the Competent Authority (Northern Ireland Environment Agency - NIEA) so that it could conduct a Stage 1 Screening Assessment. NIEA's Stage 1 Screening Assessment was completed for the submitted planning applications and it concluded that the Tyrone – Cavan Interconnector would have "*no likely significant effects on the designated site features provided conditions are imposed on any decision notice to ensure that all mitigation measures outlined in the consolidated ES are implemented*" (NIEA Consultation Response letter 30 June 2014 Reference 20577-2).

A review of the draft/shadow Stage 1 Habitats Regulations Assessment screening report (Appendix 10H Consolidated ES) was undertaken as part of the preparation of the Consolidated ES Addendum. This review identified the need to update the information required to inform the Habitats Regulations Assessment for the following reasons:

- The draft/shadow Stage 1 Habitats Regulations Assessment was prepared at a time when the design of the associated North-South 400kV Interconnection Development in RoI had not been fully crystallised;
- The in-design mitigation has been modified to include additional bird diverters between Towers 1 and 13; and,
- The inclusion of more remote (greater than 30km) SPA sites for which whooper swan is a qualifying interest species. Migratory movements of whooper swan are known to occur between the 'staging sites' at Lough Foyle SPA and Lough Swilly SPA, to sites further south of the Tyrone – Cavan Interconnector in both Autumn and Spring. As irregular movements of small numbers of birds may also occur (Robinson et al, 2004) between European sites it was considered prudent to reassess the Likely Significant Effects on these remote SPA Sites where whooper swan is a qualifying feature.

[1] Planning Policy Statement 2 Natural Heritage (PPS 2) (DoE, 2013)

The revised Stage 1 Habitats Regulations Assessment screening presented in this report, upholds the conclusions of no likely significant effects on the conservation objectives of any European Site in the construction or operational phase of the proposed Tyrone Cavan Interconnector (Appendix 10H, 2013).

In the unlikely scenario that the Competent Authority in their Stage 1 Habitats Regulations Assessment screening comes to a differing conclusion, information that would allow the Competent Authority to undertake a Habitats Regulations Assessment (Stage 2) is presented in this report.

1.1 Consultation

Consultation has taken place with the Department of the Environment (DoE) and due regard has been given to their representations. The approach to the HRA has included liaison with the NIEA of the DoE and involved early discussions on the scope and level of detail required to assess the potential impacts on the ecological receptors and conservation objectives that define European protected sites. As the potential impacts on European sites outwith the borders of Northern Ireland must be taken into account, consultation has also taken place with the National Parks and Wildlife Service (NPWS) of the RoI, with respect to likely significant effects on European sites in that jurisdiction.

Formal consultation with governmental and non-governmental bodies and individuals was conducted during preparation of the Environmental Statement of the Tyrone – Cavan Interconnector and these have been taken into account, where relevant, when preparing this report.

List of agencies consulted:

- JNCC website, Tyrone - Cavan Interconnector information for the published Consolidated ES.
- NPWS website
- NIEA website
- NIEA: Conservation Designations and Protection Unit for Conservation Objectives
- NIEA: Ian Enlander consulted with regard to survey requirements
- Irish Whooper Swan Study Group (IWSSG)

Responses to Consultation:
NIEA's Stage 1 Screening Assessment was completed for the submitted planning applications and it concluded that the Tyrone – Cavan Interconnector would have "*no likely significant effects on the designated site features provided conditions are imposed on any decision notice to ensure that all mitigation measures outlined in the consolidated ES are implemented*" (NIEA Consultation Response letter 30 June 2014 Reference 20577-2).

IWSSG responded that the location of the Tyrone - Cavan Interconnector well to the west of the Keady lakes suggests that it will have little impact on birds that are wintering there (pers com. J. Devlin). Swans readily move between the lakes when they are disturbed. IWSSG is not aware of any movement of swans across the proposed line route when they are wintering in the area.

2 Statutory Context

2.1 The Habitats Directive

European Directive 92/43/EEC on the 'Conservation of Natural Habitats and Wild Fauna and Flora', referred to as the 'Habitats Directive', provides legal protection for habitats and species of European importance. .

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest, and requires the creation of a coherent EU ecological network of designated Natura 2000 sites (e.g. SACs and SPAs) and a requirement to take the requisite measures to establish a system of protection for the habitats and species listed. The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national and international level.

Article 2 of The Habitats Directive outlines that habitats and species qualifying interests protected by the Directive must be maintained in 'favourable conservation status' within their range. The conservation status of qualifying interests will be taken as 'favourable' when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.
- Favourable conservation status of a species (as defined in Article 1 of the Habitats Directive) is achieved when:
- Population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

Articles 3 - 9 provide the legislative means to protect habitats and species of Community interest.

In particular, Article 6 (3) of the Directive states:

"*Any plan or project not directly connected with, or necessary to, the management of the [European] site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives*".

A 'European Site' or Natura 2000 Site includes Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) as well as candidate/proposed sites (cSAC and pSPA) which are being consulted on or are pending a European Commission decision. For the purposes of considering development proposals and their likely impacts on such sites, as a matter of policy, the Government wishes those pSPAs and cSACs, that have been included in a list sent to the European Commission, to be considered in the same way as if they had already been classified or designated. As a matter of policy, listed Ramsar sites also receive the same protection as designated SPAs and SACs. Most Ramsar sites are also SPAs or SACs. Please note that from this point forward the term European Site will be used to represent all of the following designations: SAC, cSAC, SPA, pSPA, Ramsar and cRamsar sites.

Article 6(4) of the Habitats Directive provides for a derogation procedure in the absence of alternative solutions and for imperative reasons of overriding public interest.

"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic

nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted."

The application of the Habitats Directive involves the precautionary principal; that is that plans and projects can only be permitted having ascertained no adverse effect on the integrity of the site. The application of Article 6(4) provides for a mechanism for approving in exceptional circumstances, plans or projects that have an adverse effect on a European Site even after the application of mitigation when these plans or projects are considered to be of imperative overriding public interest and no suitable alterative solutions exits. In such cases compensatory measures will be necessary to ensure the overall integrity of network of sites.

2.2 The Habitats Regulations

The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) provide for the designation, protection and management of 'European Sites', the protection of 'European Protected Species' and the adaptation of planning and other controls for the protection of European Sites.

In accordance with the legislation set out above, the Habitats Regulations require a Habitats Regulations Assessment (HRA) screening assessment, to be carried out to determine any likely significant effects of the Tyrone – Cavan Interconnector on European Sites in view of their Conservation Objectives. This report presents the Competent Authority with all the relevant information on the proposed project to allow them to undertake the HRA

3 Methodology

3.1 Introduction

The information and assessments presented in this report have been carried out in accordance with the following guidance, as the standard used by NIEA, and also incorporates recent guidance commissioned by Scottish Natural Heritage (SNH 2013): :

- Office for Official Publications of the European Communities, Luxembourg (EC, 2000). Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- Office for Official Publications of the European Communities, Luxembourg (EC, 2001). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitat Directive 92/43/EEC; and,
- Office for Official Publications of the European Communities, Luxembourg (EC, 2007). Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission.

3.2 Habitats Regulation Assessment

The methodology for the HRA is in accordance with the EU guidance document '*Assessment of plans and projects significantly affecting Natura 2000 sites'.*

It has become generally accepted that a stage by stage approach should be followed for an HRA as proposed by European Commission guidance. These stages are:

- Stage One: **Screening** — the process which identifies whether there are likely to be any effects upon a Natura 2000 site as a result of the project or plan, either alone or in combination with other projects or plans, and considers whether these effects are likely to be significant;
- Stage Two: **Appropriate Assessment** — the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are significant effects, an assessment of the potential mitigation of those impacts;
- Stage Three: **Assessment of alternative solutions** — the process which examines alternative ways of achieving the objectives of the project or plan that avoid significant effects on the integrity of the Natura 2000 site identified at Stage Two; It should be noted that the Developer places no reliance upon this stage of the process in the context of the application for approval for the proposed development
- Stage Four: **Assessment where no alternative solutions exist and where adverse impacts remain** — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed. It should be noted that the Developer places no reliance upon this stage of the process in the context of the application for approval for the proposed development

Each stage determines whether a further stage in the process is required. If, for example, the conclusions at the end of Stage One are that there are no likely significant effects on the European Sites, there is no requirement to proceed further. This report considers the first stage of the assessment, the Screening Stage.

The purpose of the Screening Stage of the Habitats Regulations Assessment is to identify any likely significant effects of the Tyrone - Cavan Interconnector in view of the conservation objectives of the European Site(s). Mitigation measures that have been incorporated into the design of the project can be considered in this Screening stage provided that the measures are known to be effective, reliable, timely and guaranteed.

Table 1 outlines the approach taken to inform the Screening stage of the Habitats Regulations Assessment.

Table 1: Habitats Regulations Assessment: Approach to Stage 1 Screening

Stage 1	
Key considerations for Screening for Likely Significant Effect	Identify all European Sites within the possible zone of influence of the proposed development
	Identify the qualifying features of the European Sites concerned and the sites the conservation objectives
	Determine which of those species and habitats could be affected by the proposed development and if the effects could be considered significant
	Examine other plans and programmes that could contribute to 'in combination' effects
	Produce Screening report (to inform the Competent Authority)on likely significant effects or report on a finding of no likely significant effects
	If significant effects are judged likely or uncertainty exists – the precautionary principle applies and the process should proceed to Stage 2 'Appropriate Assessment'

4 Description of the Proposed Development

4.1 Introduction

This Section provides a description of the Tyrone – Cavan Interconnector. An integral element of the description of the proposed development, is the in-design (incorporated) mitigation. This is considered relevant to the Screening stage in line with the Dilly Lane Judgement in the English High Court.

The Tyrone – Cavan Interconnector forms the Northern Ireland element of the overall proposed interconnector, which is being jointly promoted by SONI and EirGrid[2] and which forms part of a major transmission system development to improve interconnection between the NIE transmission system in Northern Ireland and the ESB[3] transmission system in the RoI.

The proposed interconnector in Northern Ireland comprises separate elements that have been made subject to two separate planning applications:

The Proposed Overhead Line and Substation

- The construction and operation4 of a new 275 / 400kV substation at Turleenan townland, north east of Moy, County Tyrone;
- The removal of an existing 275kV suspension tower and the construction and operation of two new 275kV terminal towers to enable connection of the Turleenan substation to NIE's existing 275kV overhead line; and,
- The construction and operation of a single circuit 400kV overhead transmission line supported by 102 towers for a distance of approximately 34km from the source substation (at Turleenan) to a border crossing between the townlands of Doohat or Crossreagh, County Armagh and Lemgare, County Monaghan, where it will tie into the ESB network. Owing to geographic border definitions in the immediate area of the border crossing point, the overhead line will need to over-sail a portion of land within the Northern Ireland townland of Crossbane for a short distance.

The proposed "Associated Works" required for construction of the proposed overhead line and substation

- The formation of temporary access tracks, and other ancillary works associated with construction of the substation and the overhead line.

4.2 Substation Construction and Description

The construction of the proposed Turleenan substation will require earthworks. The general construction methods and strategies described below are based upon "best practice" methods used in constructing substations of this type. The estimated construction period for the proposed substation is three years from the start of the site works. The construction process will consist of the following elements:

- site enabling works, including site clearance, the construction of temporary access roads and temporary fencing;
- earthworks for site levelling and preparation;
- installation of drainage, and surrounding landscaping and planting;
- construction of buildings;
- installation of equipment; and,

[2] EirGrid is the company responsible for planning and operation of the electricity transmission system in the Republic of Ireland.

[3] The Electricity Supply Board (ESB) is the company responsible for ownership and maintenance of the transmission system in the Republic of Ireland.

[4] The System Operator Northern Ireland (SONI) will be operating the Tyrone – Cavan Interconnector.

- landscaping, provision of permanent fencing and an access road.

The substation installation will incorporate a control building, a 275kV GIS[5] building, provision for three 500MVA power transformers with associated firewalls, and an open air 400kV switchyard containing high voltage electrical equipment. The installation will be constructed within a 193m x 134m[6] securely fenced compound, and will have a maximum height of 12.5m to the top of the proposed GIS building. The proposed ancillary works will include an access road, surrounding earthworks, land contouring and landscape planting. In addition, two new 275kV towers within the substation site will be 46m and 54m in height.

During operation of the substation, a low level of sensor-operated access lighting will be provided to allow safe access to the building and manually operated high level lighting will be used to permit general maintenance and operation of local controls in the hours of darkness. There will be no lighting in general use during the normal operation of the substation.

The drainage for the proposed substation site (hardstanding area and access road) has been designed in accordance with the Sustainable Drainage Systems (SuDS) principles and the Construction Industry Research and Information Association (CIRIA) SuDS Manual 2007.

A three stage treatment to ensure water quality has been designed.

- Treatment Stage 1 – Treatment of stormwater using infiltration (interception storage)

The site compound will be constructed of gravel material filtering the stormwater at location. This will provide pollutant filtration at source. There will also be some hydrocarbon removal at this stage as the hydrocarbons will be attached to the suspended solids removed via filtration. The infiltration technique will treat smaller events via filtration through the soils and discharge them to groundwater.

- Treatment Stage 2a – Filter Drains

Water from the site will be conveyed through a series of filter drains (half perforated and unperforated). These linear drains will be filled with a permeable material and offer filtration, adsorption, biodegradation and volatilisation pollutant removal. There are also a number of perforated field drains proposed which will allow infiltration throughout the site.

- Treatment Stage 2b – Oil interception

Two oil interceptors are proposed and will act to separate the hydrocarbons from the water which can then be drawn off during maintenance. The interceptors are located outside of the 1-in-100 year floodplain. Sediments will also settle within the system and can be drawn off during maintenance procedures. Interceptors will conform to the European Standard PR EN 858 – 1 & 2.

- Treatment Stage 3 – Pond/Wetland

A pond has been proposed and will provide secure water quality by capturing the small rainfall events and settling out fine silts and promote plant and microbial activity to encourage adsorption and biodegradation of contaminants and nutrient removal. The pond will be approximately 85m long and 14.5m wide.

[5] Gas Insulated Switchgear.

[6] Maximum overall dimensions to external fencing.

4.3 Overhead Line Construction and Description

The estimated construction period for the entire overhead line route has been estimated as three years from the start of the site works, but the construction period at any particular location along the overhead line route would be in the order of four to six months. Materials for construction will be stored at Carn depot, NIE's main regional depot which is close to Craigavon.

Overhead conductors, insulators and earthed shield wires will be carried on a total of 102 steel lattice towers within Northern Ireland. The spacing between the proposed towers will range from approximately 158m to 476m and will on average be approximately 336m. Tower heights will range from 25m to 41m and the average height will be 34m. The overhead line construction will be carried out in parallel with the substation construction, and will be undertaken in five stages, in the following sequence, and on a rolling programme along the line route:

- Stage 1 – Preparatory Site Work (1 - 7 working days):
    - Installation of temporary access tracks - of the 113 proposed access tracks, 53 will be temporarily stoned;
    - Levelling of tower foundation area;
    - Vegetation clearance – including trimming of any tall trees that could interfere with the overhead line during operation;
    - Diversion of drains;
    - Erection of temporary fencing; and,
    - Diversion of telecommunications lines (17 locations) and undergrounding of lower voltage (LV) electricity lines (18 locations).
- Stage 2 - Tower Foundations (3 – 6 working days):
    - The maximum foundation size of any tower is 20 x 20m. The foundation of each tower will require an excavation which will then be filled with concrete and steel to form a foundation for tower construction. Surplus excavated material will be sent to landfill.
    - Any water pumped from the excavation will need to be discharged following treatment. All water pumped from excavations will be passed through a filtration system to allow the settlement of silt before the water is discharged.
- Stage 3 - Tower Assembly and Erection (3 – 4 working days):
    - The steel for the remainder of the tower will be delivered to the site by lorry from the Carn depot and various sections of the tower will then be pre-assembled on the ground beside the tower.
    - The working area required for construction of each overhead line tower is 35m x 35m (1,225m^2). The working area for 40 towers will be temporarily stoned.
- Stage 4 - Conductor/Insulator Installation (7 working days):
    - The overhead electricity conductors are secured to the towers by means of a stringing operation. This is undertaken between each set of angle towers in a straight line between the two angle towers.
    - Where the overhead line is to be strung over roads and the River Blackwater, temporary protection in the form of guard poles, scaffolding or a telescopic handler will be provided. The guarding locations will ensure that the stringing operation does not interfere with road users or the River Blackwater.
- Stage 5 – Reinstatement of Land (1 - 5 working days):

Once all works are complete at a location, the access route and the construction areas around each tower will be restored to their original condition. This work will be carried out by a specialised agricultural contractor and will be undertaken in consultation with each relevant landowner.

4.4 In-Design/incorporated Mitigation for the Overhead line

As part of the standard incorporated mitigation included within the Consolidated Environmental Statement, **bird flight diverters have been prescribed for installation on the earth wire component of the overhead line between Towers 30 and 43 for whooper swan. Additional diverters are to be installed between Towers 1 and 1**3 in accordance with a request from NIEA, as it was noted during consultation and survey that whooper swan occasionally fly along the River Blackwater at the northern end of the Scheme.

This incorporation of mitigation in project design and its examination within the Screening stage is in accordance with the Dilly Lane Ruling (Hart District Council v. Secretary of State for Communities and Local Government, Luckmore Limited and Barratt Homes Limited, [2008]). In this case the judge ruled that:

"avoidance or mitigation measures forming part of the plan or project can, as a matter of law, be considered at the screening stage... [I]f the Competent Authority is satisfied at the screening stage that the proponents of a project have fully recognised, assessed and reported the effects, and have incorporated appropriate mitigation measures into the project, there is no reason why they should ignore such measures when deciding whether an appropriate assessment is necessary... The provisions in the Habitats Directive are intended to be an aid to effective environmental decision making, not a legal obstacle course... [T]here is no legal requirement that a screening assessment... must be carried out in the absence of any mitigation measures that form part of a plan or project. On the contrary, the Competent Authority is required to consider whether the project, as a whole, including such measures, if they are part of the project, is likely to have a significant effect on the SPA."

5 Identification of European Sites

5.1 Introduction

The proposed Tyrone-Cavan Interconnector is a project with a clearly defined physical footprint, both during construction, operation and decommissioning. The area occupied by the completed overhead line and supporting towers is 34.3km long, up to 54m high (one 275kV tower at the Turleenan substation) and a maximum width of 25.6m (the cross-arm of one of the terminal towers at the Turleenan substation). The footprint of the towers on the ground is a maximum of 20x20m. The area of the substation is 2.25ha (hard standing area). The proposed towers are spaced apart by up to 476m with the overhead line passing from tower to tower oversailing the land below it.

The overall orientation of the overhead line is between NNE and SSW in Northern Ireland. This characteristic is important in considering the potential impact of the interconnector.

The Tyrone - Cavan Interconnector does not cross over any European Site and is not immediately adjacent to any sites. To determine which European Sites require to be considered in the context of the Tyrone - Cavan Interconnector for the purposes of a Habitats Regulations Assessment, a review of all European sites within 30km of the overall project study area was carried out. Given the long linear nature of the project and the presence of mobile species such as wintering birds, it was initially considered that a 30km buffer adequately encompasses all European Sites requiring consideration regarding potential connections to the study area and the Tyrone - Cavan Interconnector. Although the Tyrone – Cavan Interconnector will be constructed in Northern Ireland, there is also a potential for activities in Northern Ireland to have, in some circumstances, impacts on designated European sites in the RoI. This report therefore identifies those European sites in RoI that, due to their citation features, or due to an identifiable linkage to potential impacts of the Tyrone – Cavan Interconnector, could be subject to similar impacts to European sites within Northern Ireland.

Whooper swan was identified as a species of concern in early consultation, based on the fact that whooper swan has poor manoeuvrability and forward vision, increasing its vulnerability to poorly marked flight obstacles, yet travels long distances and that birds frequently make twice-daily flights between feeding and roosting sites in very low light conditions.

However, none of the flightlines between feeding and roosting sites recorded during ecological studies for the project crossed the proposed overhead line route, and birds that winter in the Blackwater River valley will not be at risk of collision during regular movements between these sites

There is currently no evidence of the routes that swans use when entering or leaving the wintering areas, but movements may take place between Lough Neagh and the areas under consideration. Movements between staging posts to the north and sites at Derryscollop and the Keady lakes are unlikely to be affected by a significant collision risk, due to the orientation of the Tyrone - Cavan Interconnector with respect to flight direction to and from staging sites. There is a potential for birds undertaking these movements into the Blackwater River valley to cross the proposed overhead line route, particularly towards its northern end. There is no evidence that existing high voltage lines that lie perpendicular to flightlines have a significant effect on local swan numbers, and the routing of the Tyrone - Cavan Interconnector along relatively low ground between surrounding hills is likely to reduce collision risk for overflying birds. However, all SPAs where whooper swan is a qualifying species were also included in the assessment to examine the potential for connections to populations within the study area.

Criteria have been determined that are designed to identify those sites that have the potential to be affected by the construction and operation of the Tyrone – Cavan Interconnector. These criteria take into account both the characteristics of the Tyrone – Cavan Interconnector and the ecological characteristics of European site designation features and their conservation objectives.

Criteria for the assessment of which European Sites to consider in Screening for likely significant effects :

- All SAC, SPA and Ramsar sites within 30km of the study area.
- European Sites within the same river catchment of the Tyrone - Cavan Interconnector, within 30km of the study area.

SPAs located greater than 30km from the study area were included (i.e. Lough Oughter Complex SPA, Lough Swilly SPA, and Lough Foyle SPA) where whooper swan is a qualifying interest for these sites and migratory movements are known to occur between these sites, principally from the 'staging sites' at Lough Foyle and Lough Swilly to sites further south in Autumn with a return migration in Spring. In addition irregular movements of small numbers of birds may also occur (Robinson *et al,* 2004)[7]. For SPA, qualifying interests considered as sensitive are those which were recorded in the study area, and that are categorised as highly or moderately collision prone.

The sites that have been considered using the criteria outlined above, together with their qualifying features are listed in Table 2.

A total of 17 designations on 11 European Sites (multiple designations on several sites) have been identified. (see Annex C Location Map). In two cases (Magheraveely Marl Loughs/ Kilroosky Lough Cluster and Slieve Beagh – Mullaghfad – Lisnaskea/Slieve Beagh) sites straddle the international border and share designation features.

Data on European sites in Northern Ireland have been provided by NIEA. Data provided by NIEA generally included the following records:

- site name;
- site code;
- grid reference and area;
- status;
- qualifying features;
- conservation objectives;
- site map; and,
- schedule of operations and activities likely to damage the flora, fauna, geological and physiographical features of the area.

Data on European sites in RoI have been accessed from the NPWS website. Data provided are generally similar to those for sites in Northern Ireland, but also includes an evaluation of threats to designation features.

The scientific names of all species mentioned in the text are listed in Annex B of this report.

Table 2: European Sites under Consideration

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
Lough Neagh and Lough Beg SPA	Breeding common tern; Breeding bird assemblage Wintering Bewick's swan, whooper swan (Annex I species) Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	8 km to substation 9 km to line route	During the breeding season the area regularly supports nationally important numbers of breeding common tern, and a nationally important assemblage of waterfowl. Over winter the area regularly supports internationally important numbers of Bewick's swan, whooper swan, pochard, tufted duck and goldeneye and nationally important numbers of 13 additional species of waterfowl. Over winter the area regularly supports 99,262 waterfowl. The Conservation Objectives for this site are: *To maintain each feature in favourable condition*	**YES -** The site is designated for migrating species such as wintering whooper and Bewick's swan populations, individuals of which may fly over the Tyrone - Cavan Interconnector or use the wider area during operation. **YES** – The substation site contains a small tributary of the River Rhone which flows into the River Blackwater. Waters from the Blackwater River and its catchment, discharge into the site. The River Blackwater is over sailed by the proposed overhead line. A Tower is present on either side of the River (Towers 32 and 33). Tower 32 is 80m from the northern bank and Tower 33 is approximately 280m south of the River Blackwater.

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
Lough Neagh and Lough Beg Ramsar	A particularly good representative example of natural or near-natural wetlands, common to more than one biogeographic region.	4km to substation 4km to line route	This site is the largest freshwater lake in the United Kingdom. Lough Neagh is a relatively shallow body of water supporting beds of submerged aquatic vegetation fringed by associated species-rich damp grassland, reedbeds, islands, fens, marginal swampy woodland and pasture. Other interesting vegetation types include those associated with pockets of cut-over bog, basalt rock outcrops and boulders, and the mobile sandy shore.	**YES** - Waters from the Blackwater River and its catchment, discharge into the site. The River Blackwater is over sailed by the proposed overhead line. A Tower is present on either side of the River (Towers 32 and 33). Tower 32 is 80m from the northern bank and Tower 33 is approximately 280m south of the River Blackwater.
	Regularly supports internationally important numbers of wildfowl species and regularly supports nationally important numbers of breeding common tern.		Over winter the area regularly supports internationally important numbers of Bewick's and whooper swans. During the breeding season the area regularly supports nationally important numbers of breeding common tern,	**YES** – The substation site contains a small tributary of the River Rhone which flows into the River Blackwater. Waters from the Blackwater River and its catchment discharge into the site. The River Blackwater is over sailed by the proposed overhead line. A Tower is present on either side of the River (Towers 32 and 33). Tower 32 is 80m from the northern bank and Tower 33 is approximately 280m south of the River Blackwater.
	Supports an important assemblage of breeding birds		Supports nationally important numbers of breeding great crested grebe, gadwall, pochard, tufted duck, snipe and redshank.	
	Supports a population of pollan		One of the few locations in Ireland and one of the two known locations in the UK for pollan.	

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
Peatlands Park SAC	Degraded raised bogs still capable of natural regeneration	4km to substation; 5km to line route	The site is one of the largest areas of degraded raised bog in Northern Ireland, extensively cut for turf in the past. Regeneration is taking place over a large part of the site. Notable species include Northern Ireland Priority Species bog rosemary.	**NO** - the SAC Is not hydrologically connected to the proposed Development.
	Bog woodland (Priority Habitat)		The woodland appears to have developed through seral succession over a shallow, peat-bottomed lake. Downy birch is dominant; with grey willow one of the main associates, and mosses abundant.	
	Active raised bogs (priority habitat)		Active raised bogs are peat-forming ecosystems that have developed during thousands of years of peat accumulation, to such an extent that the depth of peat isolates them from the influence of groundwater. Active bog vegetation is characteristic of intact (primary) bog surfaces, but peat-forming communities may occur on bogs which have previously been cut for peat (secondary surfaces). Present as a qualifying feature, but not a primary reason for selection of this site	
	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles		This habitat type comprises a range of woodland types dominated by mixtures of oak and birch. It is characteristic of base-poor soils in areas of at least moderately high rainfall in northern and western parts of the UK. Present as a qualifying feature, but not a primary reason for selection of this site.	
Slieve Beagh – Mullaghfad – Lisnaskea SPA	Breeding hen harrier	23 km to closest point of Tyrone - Cavan Interconnector	The site includes coniferous plantations, blanket bog, wet and dry heath, grass moor, scrub and limited semi-improved agricultural	**NO -** The Tyrone - Cavan Interconnector is outside the feasible foraging area of breeding hen harriers.

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
Slieve Beagh SPA (RoI)		20km to closest point of Tyrone - Cavan Interconnector	grassland. The mix of forestry and open areas provides optimum habitat conditions for breeding harriers.	
Slieve Beagh SAC	Natural dystrophic lakes and ponds	24km to closest point of Tyrone - Cavan Interconnector	The site contains the largest concentration of medium- to large-sized dystrophic lakes in Northern Ireland.	**NO** - the site is in a different catchment to the works and is hydrologically isolated from the Tyrone - Cavan Interconnector.
	Blanket bogs (Priority Habitat)		One of the most extensive areas of intact blanket bog in Northern Ireland.	
	European dry heath		Present as a qualifying feature, but not a primary reason for selection of this site	
Slieve Beagh Ramsar	Blanket bog and nationally important wetland habitats.	25km to closest point of Tyrone - Cavan Interconnector	The site is a large and relatively intact example of a blanket bog and one of the best examples of this habitat in the UK. It also contains nationally important examples of transitional and alkaline fen and oligotrophic/mesotrophic lakes.	**NO -** the site is in a different catchment to the works and is hydrologically isolated from the Tyrone - Cavan Interconnector.
Magheraveely Marl Loughs SAC	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. (Priority Habitat),	24km to closest point of Tyrone - Cavan Interconnector	Contiguous with Kilroosky Lough Cluster SAC (RoI). This site is important because the water has not been influenced by nutrient enrichment and remains clear, with high lime content and low plant nutrient content.	**NO -** the site is in a different catchment to the works and is hydrologically isolated from the Tyrone - Cavan Interconnector.
	Alkaline fen		The lakes are surrounded by an inundation zone containing significant stands of alkaline fen vegetation, including a number of notable plant species.	
	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* (Priority Habitat)		Present as a qualifying feature, but not a primary reason for selection of this site	

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
	White clawed crayfish (Annex II species)		A strong isolated population of white clawed crayfish. This site has been selected because of its hydrological isolation and the absence of crayfish plague from Northern Ireland.	
Magheraveely Marl Loughs Ramsar	A combination of hard water and low nutrient status has produced loughs that approach the classic marl lake condition.	24 km to closest point of Tyrone - Cavan Interconnector	Lakes are surrounded by wetlands whose interest is also indicated by high calcium concentration. Biological interest is related to the presence of vegetation which reflects these calcareous conditions, including rich and extensive stonewort (*Charophyte*) communities with several rare and local species, including *Chara aspera*, *C. curta*, *C. hispida*, *C. pedunculata* and *C. rudis*.	**NO -** the site is in a different catchment to the works and is hydrologically isolated from the Tyrone - Cavan Interconnector.
Slieve Gullion SAC	European dry heath	24 km to closest point of Tyrone - Cavan Interconnector	Slieve Gullion is one of the largest expanses of European dry heath in Northern Ireland. The site contains a number of dry heath communities, reflecting the wide range of environmental conditions.	**NO -** the site is at a higher altitude than the proposed construction works, and there is no impact vector present.
Montiaghs Moss SAC	Marsh fritillary butterfly	24km to closest point of Tyrone - Cavan Interconnector	Montiaghs Moss is an extensive area of cut-over bog, which contains one of the largest and longest-established populations of marsh fritillary in Northern Ireland. The population is very dispersed throughout the entire site, reflecting the extent of habitat that is suitable for the species.	**NO** - The designation feature will not be impacted as a result of the Tyrone - Cavan Interconnector because it does not migrate and the supporting habitat is remote from the Tyrone - Cavan Interconnector and its potential associated effects.
Kilroosky Lough Cluster SAC (RoI)	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. (priority habitat),	29 km to closest point of Tyrone - Cavan Interconnector	Lakes are of moderate to good quality and contain well-developed and diverse stonewort beds	**NO** - The site is distant and in a different water catchment to the Tyrone - Cavan Interconnector and is therefore hydrologically

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* (priority habitat)		Small but good examples of semi-natural lake margin habitats. A number of notable plant and invertebrate species have been recorded from the site including the Red Data Book species, round leaved wintergreen.	isolated from the Tyrone - Cavan Interconnector
	Alkaline fen		Small but good examples of semi-natural lake margin habitats.	
	White clawed crayfish (Annex II species)		Two of the loughs support good populations of white clawed crayfish, which requires calcium-rich waters to maintain its exoskeleton.	
Deroran Bog SAC	Active raised bog	29km to closest point of Tyrone - Cavan Interconnector	Typical of western bogs within the drumlin belt of Northern Ireland, being rather irregular in shape. The bog displays the classic convex domed profile typical of lowland raised bogs but has a relatively subdued microtopography with occasional small pools, and a few large hummocks.	**NO** - The site is distant and in a different water catchment to the Tyrone - Cavan Interconnector and is therefore hydrologically isolated from the Tyrone - Cavan Interconnector

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
Lough Oughter Complex SPA (RoI)	Wintering whooper swan (Annex I species), wigeon. Breeding great crested grebe Wetland and waterbirds	43km to closest point of Tyrone - Cavan Interconnector	Internationally important numbers of whooper swan, nationally important numbers of wigeon, great crested grebe. The Conservation Objectives for this site are *To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:*	**YES -** The site is designated for migrating species such as wintering whooper swan populations, individuals of which may fly over the Tyrone - Cavan Interconnector or use the wider area during operation. **NO** – For wigeon, the site is distant and birds are unlikely to cross the proposed overhead line. **NO** – Other water birds likely to be restricted to vicinity of the SPA during the breeding season **NO** – Wetland - The site is distant and in a different water catchment to the Tyrone - Cavan Interconnector and is therefore hydrologically isolated from the Tyrone - Cavan Interconnector
Lough Foyle SPA	Wintering, whooper swan, bar-tailed godwit (Annex I species), light-bellied brent goose. Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	74km to closest point of Tyrone - Cavan Interconnector	Internationally important numbers of whooper swan, bar-tailed godwit, light-bellied brent goose. Nationally important numbers of a further 20 waterfowl species. The site acts as a staging post for, particularly, whooper swans before dispersal into Northern Ireland and RoI. The Conservation Objectives for this site are: *To maintain each feature in favourable condition*	**YES -** The site is designated for migrating species such as wintering whooper swan populations, individuals of which may fly over the Tyrone - Cavan Interconnector or use the wider area during operation.

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
Lough Foyle Ramsar	The site qualifies under Criterion 1a of the Ramsar Convention by being a particularly good representative example of a wetland. The site also qualifies under Criterion 1c by being a particularly good representative example of a wetland, which plays a substantial hydrological, biological and ecological system role in the natural functioning of a major river basin which is located in a trans-border position.	74km to closest point of Tyrone - Cavan Interconnector	The wetland complex includes intertidal sand and mudflats with extensive seagrass beds, saltmarsh, estuaries and associated brackish ditches.	**NO -** the site is in a different catchment to the works and is hydrologically isolated from the Tyrone - Cavan Interconnector.

European Sites under Consideration				
Site	**Designation feature(s)**	**Distance from the Proposed Development**	**Feature Description**	**Identification of Features For Further Consideration**
Lough Swilly SPA (RoI)	Wintering, whooper swan, Greenland white-fronted goose (Annex I species) and greylag goose. Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	85km to closest point of Tyrone - Cavan Interconnector	Internationally important numbers of whooper swan, Greenland white-fronted goose, greylag goose, nationally important numbers of a further 21 species. The site acts as a staging post for, particularly, whooper swans before dispersal into Northern Ireland and RoI. The Conservation Objectives for this site are: *To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Lough Swilly SPA, which is defined by the following list of attributes and targets (note that this objective relates to all waterbird species of Special Conservation Interest).*	**YES -** The site is designated for migrating species such as wintering whooper swan populations, individuals of which may fly over the Tyrone - Cavan Interconnector or use the wider area during operation.

6 Evaluation of Likely Significant Effects

The Tyrone – Cavan Interconnector is not directly connected with or necessary to the management of the European Sites under consideration.

The Tyrone - Cavan Interconnector does not impact directly on any European Sites. No element of the project is within or adjacent to any European Site. The focus of the Screening exercise is therefore on the identification of any indirect effects on European Sites in view of their conservation interests that may occur during the construction or the operation of the Tyrone - Cavan Interconnector. Seventeen European Sites were examined for any broad connections between the sites or their qualifying features and the Tyrone - Cavan Interconnector in terms of distance, hydrological linkages or the presence of mobile qualifying features with the potential to be impacted by the development.

The following five European Sites were identified for consideration:

- Lough Neagh and Lough Beg SPA;
- Lough Neagh and Lough Beg Ramsar Site;
- Lough Foyle SPA;
- Lough Swilly SPA; and,
- Lough Oughter Complex SPA.

In order to determine if the Tyrone - Cavan Interconnector could result in any Likely Significant Effects on these sites in view of their conservation objectives, the following process was carried out:

The qualifying features (i.e. habitats / species) for the identified European sites were reviewed and any possible connections (e.g. via surface and groundwater) to effects of the development were identified and assessed. The conservation status of species and habitats has been taken into account based on status assessments, where available. Additional considerations and information gathering exercises informed the screening appraisal including:

- Understanding that a best practice approach is being implemented for design / construction; and,
- Extensive desk study, consultation (with statutory and non-statutory agencies (including NIEA, Irish Whooper Swan Study Group (IWSSG) and RSPB) and findings of extensive multi-year ecological field surveys. These studies provided the robust data required to establish bird usage within study area and to inform the assessment in terms of determining the likelihood of movements of these birds outside of the study area thereby assessing possible connectivity with remote SPA sites.

In accordance with Regulation 43(1) of the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 (as amended), the assessment to inform NIEA has considered whether the application either alone or in combination (neither being directly connected with or necessary to the management of the site) is likely to have a significant effect on the identified European Sites.

As part of that consideration, this report has:-
(a) taken into account the incorporated mitigation measures contained in the application, along with all legally enforceable obligations designed to avoid environmental effects; and,

(b) applied the precautionary approach set out in Commission Guidance: Managing Natura 2000 Sites and as required by the European Court of Justice in C-127/02 (Waddenzee).

The screening appraisal for the Tyrone - Cavan Interconnector is detailed in Tables 3 – 12. All qualifying interests of the European Sites (Lough Neagh and Lough Beg SPA, Lough Neagh and Lough Beg Ramsar Site, Lough Foyle SPA, Lough Swilly SPA and Lough Oughter Complex SPA) are considered. This assessment considers both the possible significant impacts from the project alone, and in-combination with other projects.

The Screening Stage requires a description of the Tyrone - Cavan Interconnector. This description has been presented in Section 4 and is therefore not repeated in all of the following matrices. For reference a summary of the key items is present in the first matrix (Table 3) only.

Table 3 Habitat Regulations Screening Matrix: Lough Neagh and Lough Beg Ramsar Site

Screening Matrix: Lough Neagh and Lough Beg Ramsar Site	
The Proposed Development	The Tyrone - Cavan Interconnector, which is described from north to south, shall involve the following: - The construction and operation of a new 275kV/400kV (source) substation at Turleenan townland, north east of Moy, County Tyrone. This is the nearest approach to the Ramsar site, which is 8.6km to the north east. - The construction and operation of two 275kV terminal towers, removal of an existing 275kV tower, and associated works to enable connection of the Turleenan substation to NIE's existing 275kV overhead line. - The provision of a settlement pond (approximately 80m long by 14m wide) at the substation site to provide sustainable drainage (SuDS) treatment of runoff from the site. - The construction and operation of a single circuit 400kV overhead transmission line supported by 102 towers for a distance of some 34.1km from the source substation (at Turleenan) to a border crossing between the townlands of Doohat or Crossreagh, County Armagh and Lemgare, County Monaghan, where it will tie into the North-South 400kV Interconnection Development. The overhead line will continue on in the Republic of Ireland with all further towers being proposed by EirGrid for placement within that jurisdiction. However, owing to geographic border definitions in the immediate area of the border crossing, there will be a 200m short section of line over sail in the Northern Ireland townland of Crossbane. - The formation of temporary access tracks and other ancillary works during construction of the substation and at each of the tower locations. - Flight diverters are prescribed for Towers 1 – 13 and Towers 30 – 43.
Brief Description of the European Site	Lough Neagh and Lough Beg Ramsar site is located in the centre of Northern Ireland. The site is the largest freshwater lake in the UK, it is a relatively shallow body of water supporting beds of submerged aquatic vegetation fringed by associated species-rich damp grassland, reedbeds, islands, fens, marginal swampy woodland and pasture. The site also supports an assemblage of rare vascular plants which include eight-stemmed waterwort, marsh pea, Irish lady's tresses, alder buckthorn, narrow small-reed and holy grass. The Lough and its margins are also home to rare invertebrates - a freshwater shrimp, eight beetles, five hoverfiles, seven moths and two butterflies. The site regularly supports substantial numbers of waterfowl indicative of wetland values, productivity and diversity; an important assemblage of breeding birds including, in nationally important numbers, great crested grebe, gadwall, pochard, tufted duck, snipe and redshank, together with other important breeding wetland (shelduck, teal, shoveler, lapwing and curlew); over 20,000 waterfowl in winter. including

Screening Matrix: Lough Neagh and Lough Beg Ramsar Site	
	nationally and internationally important numbers of pochard, tufted duck, goldeneye, little grebe, great crested grebe, cormorant, mute swan, greylag goose, shelduck, wigeon, gadwall, teal, mallard, shoveler, scaup, and coot; internationally important numbers of wintering Bewick's and whooper swans; nationally important numbers of breeding common tern; and, a population of pollan
Assessment Criteria	
Describe the individual elements of the Proposed Development (either alone or in combination with other plans or Proposed Developments) likely to give rise to impacts on the Natura 2000 site.	The operation of the Tyrone - Cavan Interconnector will not impact the Natura 2000 site or alter the habitats within its boundary. The substation and tower locations have been sited and designed to minimise all emissions to water resulting from the Tyrone - Cavan Interconnector. This includes any potential dewatering which may have to be carried out during preparations for the laying of foundations for the substation or towers. The Tyrone - Cavan Interconnector has been assessed for its water quality implications (surface and groundwater). In relation to the substation site, the proposed drainage system will provide multiple barriers to treat runoff before it is discharged from the site. In the event of an extreme flood event, the location of the pond will not be subject to high velocity flood waters as, due to the distance from the main rivers the floodplain function is predominantly for storage and not conveyance, therefore, the potential for any mobilisation is minimal. In addition, the impact from the pond in a 1-in-100 year flood event is considered to be insignificant. If material was mobilised under storm conditions, the receiving watercourse will also be in spate and will have elevated suspended sediment concentrations. Any contaminants that are mobilised from the treatment wetland / pond will be rapidly dispersed, short term, and are very unlikely to become bio-available to aquatic organisms. It has been concluded that with pollution control as an integral part of the site Environmental Management Plan, any emissions to water from either surface or groundwater sources will be minimal. Any potential for any impacts on the Lough waters, 8.6km to the north east, is negligible. Potential impacts on Ramsar site features would be confined to the collision risk for birds that use the site as a wintering or staging area, and which may cross the proposed overhead line route on migration or commuting flights. There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the Ramsar site, for example whooper swans, which may increase the risk of collision with nearby overhead lines.

Screening Matrix: Lough Neagh and Lough Beg Ramsar Site	
Describe any likely direct, indirect or secondary impacts of the Proposed Development (either alone or in combination with other plans or Proposed Developments) on the Natura 2000 site by virtue of:	
Size and scale	None of the works will take place within the Ramsar site.
Land-take	There will not be any land take from the Ramsar site.
Distance from the Natura 2000 site or key features of the site	The Tyrone - Cavan Interconnector is approximately 8.6km to the south of the Ramsar Site. One of the key features of the site is mobile species: whooper swan, which may use the Ramsar Site as a wintering/staging area may also frequent the Blackwater River valley and a site at Derryscollop. The nearest known wintering site for swans is at Edenderry Lough, 1km to the west of the proposed line, although this has been rarely, if at all, used in the past five years. Birds wintering in the Blackwater River valley use sites ~4km to the west of the line and Derryscollop is 3km to the east. However, swans have been seen feeding on two occasions in the past 5 years under overhead lines at Clonbeg, around 1km to the east of the proposed substation site.
Resource requirements (water abstraction etc)	No abstraction will take place as a result of the Tyrone - Cavan Interconnector.
Emissions (disposal to land, water or air)	Potential impacts to the Ramsar site have been minimised through appropriate tower and substation siting, however accidental emissions to water may occur as a result of the construction of the Tyrone - Cavan Interconnector. In all cases the potential for dewatering and accidental emissions have been examined and the pollution control measures to address these issues are an integral part of the site Environmental Management Plan. Therefore it is considered that there will be no likely significant effect on receiving waters >8km downstream.
Excavation requirements	There will be localised excavation for tower bases, remote from the site. Excavations for the substation will be extensive, but also remote from the site. Pollution control is an integral part of the Construction Environmental Management Plan (CEMP). The CEMP is presented in Annex D.
Transportation requirements	The management of the transport of excavated material will take place according to the CEMP. Plant and materials will be delivered to site (substation and tower sites) by lorry.
Duration of construction, operation, decommissioning etc.	It is anticipated that the longest period of construction would be for the overhead line part of the Tyrone - Cavan Interconnector. This will take 2 to 3 years to complete. The lifespan of the Tyrone - Cavan Interconnector is intended to be extended beyond its 50-80 year design life, if required, depending on its condition and refurbishments and depending on the transmission network requirements. It is likely that the effects of decommissioning would be temporary and of a similar scale or less than the construction phase.
Other	None

Screening Matrix: Lough Neagh and Lough Beg Ramsar Site	
Describe any likely changes to the site arising as a result of:	
Reduction in habitat area;	The Tyrone - Cavan Interconnector will not lead to any reduction in habitat areas in the Ramsar site.
Disturbance to key species;	The Tyrone - Cavan Interconnector will not lead to the disturbance of any of the key species either during the construction or operational phase.
Habitat or species fragmentation;	There will be no habitat or species fragmentation as a result of the Tyrone - Cavan Interconnector.
Reduction in species density;	No reduction in species density is anticipated.
Changes in key indicators of conservation value (water quality etc);	Although there is potential for minor accidental discharges of, mainly silt, no changes to the key indicators of conservation value will occur. Silt precipitated into the substation SuDS pond will be retained as pond floor sediment. Accumulations will be cleaned out on a regular basis to prevent weather induced perturbation into the water column and potential overflow into watercourses.
Climate change.	The Tyrone - Cavan Interconnector will have a no significant impact on climate change in terms of emissions as a result of construction activities. One of the main reasons that this development is required is to facilitate the development of renewable power generation – by strengthening the flexible exchange of power flows over a large area of the island of Ireland. This will enable the connection and operation of larger volumes of renewable power generation (especially wind-powered generation) throughout the island and in turn help to facilitate meeting targets for renewable generation.
Describe any likely impacts on the Natura 2000 site as a whole in terms of:	
Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	Whooper swans that may use the site and are part of the designation population may cross the route of the proposed overhead line to wintering grounds in the Blackwater River valley and areas further south. Birds using the valley are generally site-faithful and are at low risk of collision with the line. It is not anticipated that the Tyrone - Cavan Interconnector will impact the key relationships that define the structure or function of the site. A series of wintering bird surveys monitored the movements of birds within the Blackwater Valley and concluded that the overhead line will not present a significant collision risk to this local population due to the lack of regular flightlines (occasional flights were noted during surveys only) over the proposed alignment and no likely significant effect is anticipated to the whooper swans population. The Consolidated Environmental Statement provides greater detail on these local populations.

Screening Matrix: Lough Neagh and Lough Beg Ramsar Site	
Provide indicators of significance as a result of the identification of effects set out above in terms of:	
Loss;	The Tyrone - Cavan Interconnector will not lead to a loss of any of the Ramsar area and does not involve any land take of the site.
Fragmentation;	The Tyrone - Cavan Interconnector will not result in any fragmentation of relevant habitats or populations.
Disruption;	The implementation of the Tyrone - Cavan Interconnector, will not cause any significant disruption to relevant habitats or populations within the Ramsar site.
Disturbance;	As a result of the implementation of the Tyrone - Cavan Interconnector, significant disturbance to relevant habitats or populations within the Ramsar site will not occur.
Change to key elements of the site.	None.
Describe from the above those elements of the Proposed Development or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	The main element of potential concern, with regard to the qualifying features of the site, is the collision risk for wintering swans that use the site for at least part of the winter. Some of the whooper swans that winter in the general vicinity of the Tyrone - Cavan Interconnector (Blackwater River valley, Derryscollop, Keady Lakes) may overfly the proposed overhead line route, however no regular flightlines have been identified. Individual birds may be at risk of collision, but this potential impact is considered *de minimis* in terms of the overall population, and will not result in a likely significant effect to the Conservation Objective of maintaining the favourable conservation condition of this species as it relates to the Ramsar site. In accordance with the Habitats Directive (92/43/EEC) the likely effects from the Tyrone - Cavan Interconnector has been assessed and it has been concluded that no likely significant effects on the qualify features selection features of the Lough Neagh and Lough Beg Ramsar Site or its conservation objectives are anticipated as a result of the Tyrone - Cavan Interconnector.

Table 4 Habitats Directive Screening Matrix: Lough Neagh and Lough Beg SPA

Habitats Directive Screening Matrix: Lough Neagh and Lough Beg SPA	
The Proposed Development	Detail of the Tyrone - Cavan Interconnector is presented in detail in Section 4. A summary is presented in Table 3.
Brief Description of the Natura 2000 Site	Lough Neagh and Lough Beg SPA site is located in the centre of Northern Ireland. The site is the largest freshwater lake in the UK, it is a relatively shallow body of water supporting beds of submerged aquatic vegetation fringed by associated species-rich damp grassland, reedbeds, islands, fens, marginal swampy woodland and pasture. It has migrant populations of pochard, tufted duck, scaup, goldeneye, Bewick's swan, whooper swan and common tern.
Assessment Criteria	
Describe the individual elements of the Proposed Development (either alone or in combination with other plans or Proposed Developments) likely to give rise to impacts on the Natura 2000 site.	The construction, operation and eventual decommissioning (if required) of the Tyrone - Cavan Interconnector will not impact the Natura 2000 site or alter the habitats within its boundary. The substation and tower locations has been sited and designed to minimise all emissions to water resulting from the Tyrone - Cavan Interconnector. This includes any potential dewatering which may have to be undertaken during preparations for the laying of foundations for the substation or towers. The Tyrone - Cavan Interconnector has been assessed for its water quality implications (surface and groundwater). It has been concluded that with pollution control as an integral part of the site Environmental Management Plan, any emissions to water from either surface or groundwater sources will be minimal. The potential for any impacts on the Lough waters, 8.6km to the north east, is negligible. Potential impacts on SPA site features would be confined to the collision risk for birds that use the site as a wintering or staging area, and which may cross the proposed overhead line route on migration or commuting flights. There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the European Site, for example whooper swans, which may increase the risk of collision with nearby overhead lines. There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the Ramsar site, for example whooper swans, which may increase the risk of collision with nearby overhead lines.
Describe any likely direct, indirect or secondary impacts of the Proposed Development (either alone or in combination with other plans or Proposed Developments) on the Natura 2000 site by virtue of:	
Size and scale	None of the works will take place within the SPA boundary.
Land-take	There will not be any land take from the SPA site.
Distance from the Natura 2000 site or key features of the site	The Tyrone - Cavan Interconnector is approximately 8.6km to the south west of the SPA. Whooper swans which may use the SPA as a wintering/staging area may also frequent the Blackwater River valley and a site at Derryscollop, both at the northern end of the Tyrone - Cavan Interconnector. The nearest known wintering site for swans is at Edenderry Lough, 1km to the west of the proposed line. Birds wintering in the Blackwater River valley use sites ~4km to the west of the line and Derryscollop is 3km to the east. Swans have been seen feeding on two occasions in the past 5years under overhead lies at Clonbeg, around 1km to the east of the proposed SuDS pond (part of

Habitats Directive Screening Matrix: Lough Neagh and Lough Beg SPA	
	the substation located at the north of the Tyrone - Cavan Interconnector).
Resource requirements (water abstraction etc)	It is not anticipated that any abstraction will take place as a result of the Tyrone - Cavan Interconnector. Potential impacts to the SPA will be confined to accidental emissions to water from the construction of the Tyrone - Cavan Interconnector. Potential impacts to the SPA site will be confined to accidental emissions to water from the construction of the Tyrone - Cavan Interconnector. Potential emissions are silt, discharges from dewatering of the excavations required for tower foundations and small-scale hydrocarbon leaks from plant. All of these impacts have been addressed in the ES via the implementation of detailed mitigation measures and therefore any impact on receiving waters >8km downstream are not considered significant.
Emissions (disposal to land, water or air)	There will be localised excavation for tower bases, remote from the site. Excavations for the substation will be extensive, but also remote from the site. In all cases the potential for accidental emissions to water and dewatering of the excavations required for foundations has been examined and the pollution control measures to address these issues are an integral part of the site Environmental Management Plan.
Excavation requirements	The management of the transport of excavated material will take place according to the CEMP. Plant and materials will be delivered to site (substation and tower sites) by lorry.
Transportation requirements	The management of the transport of excavated material will take place according to the CEMP. Plant and materials will be delivered to site (substation and tower sites) by lorry.
Duration of construction, operation, decommissioning etc	It is anticipated that the longest period of construction would be for the overhead line part of the Tyrone - Cavan Interconnector. This will take 2 to 3 years to complete. The lifespan of the Tyrone - Cavan Interconnector is intended to be extended beyond its 50-80 year design life, if required, depending on its condition and refurbishments and depending on the transmission network requirements. It is likely that the effects of decommissioning would be temporary and of a similar scale or less than the construction phase.
Other	None.
Describe any likely changes to the site arising as a result of:	
Reduction in habitat area	The Tyrone - Cavan Interconnector will not lead to any reduction in habitat areas in the SPA site.
Disturbance to key species	The orientation and location of the Tyrone - Cavan Interconnector and the small numbers of whooper swans recorded in the airspace of the Propose Development would indicate that potential impact of whooper swan collisions with the overhead line would be negligible and therefore of no likely significance effect.
Habitat or species fragmentation	There will be no habitat or species fragmentation as a result of the Tyrone - Cavan Interconnector.
Reduction in species density	No reduction in species density is anticipated.
Changes in key indicators of	No changes to the key indicators of conservation value are anticipated. Silt precipitated

Habitats Directive Screening Matrix: Lough Neagh and Lough Beg SPA	
conservation value (water quality etc)	into the substation SuDS pond will be retained as pond floor sediment. Accumulations will be cleaned out on a regular basis to prevent weather induced perturbation into the water column and potential overflow into watercourses.
Climate change.	The Tyrone - Cavan Interconnector will have a no significant impact on climate change in terms of emissions as a result of construction activities. One of the main reasons that this development is required is to facilitate the development of renewable power generation – by strengthening the flexible exchange of power flows over a large area of the island of Ireland. This will enable the connection and operation of larger volumes of renewable power generation (especially wind-powered generation) throughout the island and in turn help to facilitate meeting targets for renewable generation.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	.Whooper swans that may use the site and are part of the SPA population, may cross the route of the proposed overhead line to wintering grounds in the Blackwater River valley and areas further south. Birds using the valley are generally site-faithful and are at low risk of collision with the line. A series of wintering bird surveys monitored the movements of birds within the Blackwater Valley and concluded that the overhead line will not present a significant collision risk to this local population due to the lack of regular flightlines (occasional flights were noted during surveys only) over the proposed alignment and no likely significant effect is anticipated to the whooper swans population. It is not anticipated that the Tyrone - Cavan Interconnector will impact the key relationships that define the structure or function of the site. The Consolidated Environmental Statement provides greater detail on these local populations.
Provide indicators of significance as a result of the identification of effects set out above in terms of:	
Loss	The Tyrone - Cavan Interconnector will not lead to a loss of any of the SPA area and does not involve any land take.
Fragmentation	The Tyrone - Cavan Interconnector will not result in any fragmentation of habitats.
Disruption	The implementation of the Tyrone - Cavan Interconnector is not anticipated to cause no likely significant effect to designation species/populations of the SPA site.
Disturbance	Disturbance to the SPA site is not anticipated as a result of the Tyrone - Cavan Interconnector.
Change to key elements of the site	There will be no change to the key elements of the site.
Describe from the above those elements of the Proposed Development or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	The main element of potential concern, with regard to the qualifying features of the site, is the collision risk for wintering swans that use the site for at least part of the winter. Some of the whooper swans that winter in the general vicinity of the Tyrone - Cavan Interconnector (Blackwater River valley, Derryscollop, Keady Lakes) may overfly the proposed overhead line route, however no regular flightlines have been identified. Individual birds may be at risk of collision, but this potential impact is considered *de*

Habitats Directive Screening Matrix: Lough Neagh and Lough Beg SPA	
	minimis in terms of the overall population, and will not result in a likely significant effect to the Conservation Objective of maintaining the favourable conservation condition of this species as it relates to the SPA. In accordance with the Habitats Directive (92/43/EEC) the likely effects from the Tyrone - Cavan Interconnector has been assessed and it has been concluded that no likely significant effects on the qualify features selection features of the Lough Neagh and Lough Beg SPA or its conservation objectives are anticipated as a result of the Tyrone - Cavan Interconnector.

Table 5 Habitats Directive Draft Screening Matrix: Lough Foyle SPA

Habitats Directive Draft Screening Matrix: Lough Foyle SPA	
The Proposed Development	Detail of the Tyrone - Cavan Interconnector is presented in detail in Section 4. A summary is presented in Table 3.
Brief Description of the Natura 2000 Site	Lough Foyle lies on the north-west coast of Northern Ireland and straddles the international border with the Irish Republic. The site comprises a large, shallow sea lough that includes the estuaries of the rivers Foyle, Faughan and Roe. The site contains extensive intertidal mud-flats and sand-flats (with blue mussel beds), saltmarsh and associated brackish ditches. The diversity of coastal habitats has resulted in the lough being of major importance for a diverse assemblage of waterbirds both during the spring and autumn migration periods, and in winter. These include swans, geese, ducks and waders. The lough is especially notable in supporting a high proportion of the international population of Canada/Ireland light-bellied brent goose. Internationally important numbers of whooper swan, bar-tailed godwit, light-bellied brent goose. Nationally important numbers of a further 20 waterfowl species. The site acts as a staging post for, particularly, whooper swans before dispersal into Northern Ireland and RoI.
Assessment Criteria	
Describe the individual elements of the Proposed Development (either alone or in combination with other plans or Proposed Developments) likely to give rise to impacts on the Natura 2000 site.	The construction, operation and eventual decommissioning (if required) of the Tyrone - Cavan Interconnector will not impact the Natura 2000 site or alter the habitats within its boundary. The potential for any impacts on the Lough waters, 69km to the north west, is negligible and therefore of no likely significant effect. Potential impacts on SPA site features would be confined to the collision risk for birds that use the site as a wintering or staging area, and which may cross the proposed overhead line route on migration or commuting flights.
Describe any likely direct, indirect or secondary impacts of the Proposed Development (either alone or in combination with other plans or Proposed Developments) on the Natura 2000 site by virtue of:	
Size and scale	None of the works will take place within the SPA boundary.
Land-take	There will not be any land take from the SPA site.

Habitats Directive Draft Screening Matrix: Lough Foyle SPA	
Distance from the Natura 2000 site or key features of the site	The Tyrone - Cavan Interconnector is approximately 69km to the south east of the SPA. Whooper swans which may use the SPA as a wintering/staging area may also frequent the Blackwater River valley and a site at Derryscollop, although from survey and consultation these numbers are considered low.
Resource requirements (water abstraction etc)	It is not anticipated that any abstraction will take place as a result of the Tyrone - Cavan Interconnector.
Emissions (disposal to land, water or air)	There will be localised excavation for tower bases, remote from the site. Excavations for the substation will be extensive, but also remote from the site. In all cases the potential for accidental emissions to water and dewatering of the excavations required for foundations has been examined and the pollution control measures to address these issues are an integral part of the site Environmental Management Plan.
Excavation requirements	The management of excavated material will take place according to the CEMP. The site is remote from the site.
Transportation requirements	The management of the transport of excavated material will take place according to the CEMP. Plant and materials will be delivered to site (substation and tower sites) by lorry.
Duration of construction, operation, decommissioning etc	It is anticipated that the longest period of construction would be for the overhead line part of the Tyrone - Cavan Interconnector. This will take 2 to 3 years to complete. The lifespan of the Tyrone - Cavan Interconnector is intended to be extended beyond its 50-80 year design life, if required, depending on its condition and refurbishments and depending on the transmission network requirements. It is likely that the effects of decommissioning would be temporary and of a similar scale or less than the construction phase.
Other	None.
Describe any likely changes to the site arising as a result of:	
Reduction in habitat area	The Tyrone - Cavan Interconnector will not lead to any reduction in habitat areas in the SPA site.
Disturbance to key species	The orientation and location of the Tyrone - Cavan Interconnector and the small numbers of whooper swans recorded in the airspace of the Tyrone - Cavan Interconnector would indicate that potential impact of whooper swan collisions with the overhead line would be negligible and therefore of no likely significant effect.
Habitat or species fragmentation	There will be no habitat or species fragmentation as a result of the Tyrone - Cavan Interconnector.
Reduction in species density	No reduction in species density is anticipated.
Changes in key indicators of conservation value (water quality etc)	No changes to the key indicators of conservation value are anticipated.
Climate change.	The Tyrone - Cavan Interconnector will have a no significant impact on climate change in terms of emissions as a result of construction activities. One of the main reasons that this development is required is to facilitate the

Habitats Directive Draft Screening Matrix: Lough Foyle SPA	
	development of renewable power generation – by strengthening the flexible exchange of power flows over a large area of the island of Ireland. This will enable the connection and operation of larger volumes of renewable power generation (especially wind-powered generation) throughout the island and in turn help to facilitate meeting targets for renewable generation.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	Whooper swans that may use the site and are part of the SPA population may cross the route of the proposed overhead line to wintering grounds further south. However, this site is far to the west of the Tyrone - Cavan Interconnector, as are the key wintering grounds to the south of the Tyrone - Cavan Interconnector (i.e. Lough Oughter Complex) or to the north of the Tyrone - Cavan Interconnector (Lough Neagh and Lough Beg SPA and Ramsar). The birds are generally site-faithful and are at low risk of collision with the line resulting in no likely significant effect. The orientation and location of the Tyrone - Cavan Interconnector and the small numbers of whooper swans recorded in the airspace of the Propose Development would indicate that potential impact of whooper swan collisions with the overhead line would be negligible and therefore of no likely significant effect.
Provide indicators of significance as a result of the identification of effects set out above in terms of:	
Loss	The Tyrone - Cavan Interconnector will not lead to a loss of any of the SPA area and does not involve any land take.
Fragmentation	The Tyrone - Cavan Interconnector will not result in any fragmentation of habitats.
Disruption	It is expected that the numbers of whooper swan collisions with overhead line will be minimal based on survey results and consultation. The orientation and location of the Tyrone - Cavan Interconnector and the small numbers of whooper swans recorded in the airspace of the Tyrone - Cavan Interconnector would indicate that potential impact of whooper swan collisions with the overhead line would be negligible and therefore no likely significant effects are expected.
Disturbance	Disturbance to the SPA site is not anticipated as a result of the Tyrone - Cavan Interconnector.
Change to key elements of the site	There will be no change to the key elements of the site.
Describe from the above those elements of the Proposed Development or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	The main element of potential concern with regard to the designation features of the site is the collision risk for wintering swans that use the site for at least part of the winter. Some of the birds that winter in the general vicinity of the Tyrone - Cavan Interconnector may overfly the proposed overhead line route. Individual birds may be at risk of collision. However, this site is far to the west of the Tyrone - Cavan Interconnector, as are the key wintering grounds to the south of the Tyrone - Cavan Interconnector (i.e. Lough Oughter Complex) or to the north of the Tyrone - Cavan Interconnector (Lough Neagh and Lough Beg SPA and Ramsar). The orientation and location of the Tyrone - Cavan Interconnector and the small numbers of whooper swans recorded in the airspace of the Proposed Development would indicate that potential impact of whooper swan collisions with the overhead line

Habitats Directive Draft Screening Matrix: Lough Foyle SPA	
	would be negligible and therefore of no likely significant effect. The potential impacts through collision are considered to be *de minimis* and will not result in a likely significant effect to the Conservation Objective of maintaining the favourable conservation condition of this species as it relates to the SPA.

Table 6 Habitats Directive Draft Screening Matrix: Lough Swilly SPA

Habitats Directive Draft Screening Matrix: Lough Swilly SPA	
The Proposed Development	Detail of the Tyrone - Cavan Interconnector is presented in detail in Section 4. A summary is presented in Table 3.
Brief Description of the Natura 2000 Site	Lough Swilly SPA is a large coastal site located in north County Donegal. It is a long sea inlet, cut through a variety of metamorphic rocks and situated on the west side of the Inishowen Peninsula in north Co. Donegal. The SPA comprises the inner part of Lough Swilly from just east of Letterkenny northwards to Killygarvan (c. 2 km north of Rathmullan) on the west side and to c. 2 km south of Buncrana on the east side. It includes the estuaries of the River Swilly, the River Leannan and the Isle Burn and the predominant habitat is sand and mud flats which are extensive when exposed at low tide. Both 'estuaries' and 'mudflats and sandflats not covered by water at low tide' are listed on Annex I of the EU Habitats Directive (92/43/EEC). Internationally important numbers of whooper swan, Greenland white-fronted goose, greylag goose, nationally important numbers of a further 21 species. The site acts as a staging post for, particularly, whooper swans before dispersal into Northern Ireland and RoI.
Assessment Criteria	
Describe the individual elements of the Proposed Development (either alone or in combination with other plans or Proposed Developments) likely to give rise to impacts on the Natura 2000 site.	The construction, operation and eventual decommissioning (if required) of the Tyrone - Cavan Interconnector will not impact the Natura 2000 site or alter the habitats within its boundary. The potential for any impacts on the Lough waters, 78km to the north west, is negligible. Potential impacts on SPA site features would be confined to the collision risk for birds that use the site as a wintering or staging area, and which may cross the proposed overhead line route on migration or commuting flights.
Describe any likely direct, indirect or secondary impacts of the Proposed Development (either alone or in combination with other plans or Proposed Developments) on the Natura 2000 site by virtue of:	
Size and scale	None of the works will take place within the SPA site.
Land-take	There will not be any land take from the SPA site.
Distance from the Natura 2000 site or key features of the site	The Tyrone - Cavan Interconnector is approximately 78km to the south east of the site. Whooper swans which may use the SPA as a wintering/staging area may also frequent the Blackwater River valley and a site at Derryscollop, both of which are located to the far north of the Tyrone - Cavan Interconnector.
Resource requirements (water abstraction etc.)	No abstraction will take place as a result of the Tyrone - Cavan Interconnector.
Emissions (disposal to land, water or air)	There will be localised excavation for tower bases, remote from the site. Excavations for the substation will be extensive, but also remote from the site. In all cases the potential for accidental emissions to water and dewatering of the excavations required for foundations has been examined and the pollution control measures to address these issues are an integral part of the site Environmental

Habitats Directive Draft Screening Matrix: Lough Swilly SPA	
	Management Plan.
Excavation requirements	There will be localised excavation for tower bases, remote from the site. Excavations for the substation will be extensive, but also remote from the site. Pollution control is an integral part of the Construction Environmental Management Plan (CEMP).
Transportation requirements	The management of the transport of excavated material will take place according to the CEMP. Plant and materials will be delivered to site (substation and tower sites) by lorry.
Duration of construction, operation, decommissioning etc	It is anticipated that the longest period of construction would be for the overhead line part of the Tyrone - Cavan Interconnector. This will take 2 to 3 years to complete. The lifespan of the Tyrone - Cavan Interconnector is intended to be extended beyond its 50-80 year design life, if required, depending on its condition and refurbishments and depending on the transmission network requirements. It is likely that the effects of decommissioning would be temporary and of a similar scale or less than the construction phase.
Other	None
Describe any likely changes to the site arising as a result of:	
Reduction in habitat area;	The Tyrone - Cavan Interconnector will not lead to any reduction in habitat areas in the SPA site.
Disturbance to key species;	The potential impact of whooper Swan collisions with the overhead line is not considered significant due to its orientation, the location of feeding/staging sites within the locality and the low number of birds likely to be present in the airspace.
Habitat or species fragmentation;	There will be no habitat or species fragmentation as a result of the Tyrone - Cavan Interconnector.
Reduction in species density;	No reduction in species density is anticipated.
Changes in key indicators of conservation value (water quality etc);	No changes to the key indicators of conservation value are anticipated.
Climate change.	The Tyrone - Cavan Interconnector will have a no significant impact on climate change in terms of emissions as a result of construction activities. One of the main reasons that this development is required is to facilitate the development of renewable power generation – by strengthening the flexible exchange of power flows over a large area of the island of Ireland. This will enable the connection and operation of larger volumes of renewable power generation (especially wind-powered generation) throughout the island and in turn help to facilitate meeting targets for renewable generation.

Habitats Directive Draft Screening Matrix: Lough Swilly SPA	
Describe any likely impacts on the Natura 2000 site as a whole in terms of:	
Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	Individual whooper swans that may use the site and are part of the SPA population may cross the route of the proposed overhead line to wintering grounds in the Blackwater River valley and areas further south. Birds using the valley are generally site-faithful and are at low risk of collision with the line. A series of wintering bird surveys conducted over 3 years monitored the movements of birds within the Blackwater Valley and consultation indicated that only very low numbers of whooper swan may be at risk of collision, but resulting in no likely significant effect on the Designated Site. This site is far to the west of the Tyrone - Cavan Interconnector, as are the key wintering grounds to the south of the Tyrone - Cavan Interconnector (i.e. Lough Oughter Complex) or are situated to the north of the Tyrone - Cavan Interconnector (Lough Neagh and Lough Beg SPA and Ramsar). The orientation and location of the Tyrone - Cavan Interconnector and the small numbers of whooper swans recorded in the airspace of the Tyrone - Cavan Interconnector would indicate that potential impact of whooper swan collisions with the overhead line would be negligible and therefore of no likely significant effect.
Provide indicators of significance as a result of the identification of effects set out above in terms of:	
Loss;	The Tyrone - Cavan Interconnector will not lead to a loss of any of the SPA area and does not involve any land take of the site.
Fragmentation;	The Tyrone - Cavan Interconnector will not result in any fragmentation of relevant habitats or populations.
Disruption;	The collision of whooper swan with the overhead line is not considered significant due to its orientation, the location of feeding/staging sites within the locality and the number of birds likely to be present in the airspace.
Disturbance;	As a result of the implementation of the Tyrone - Cavan Interconnector, significant disturbance to relevant habitats or populations within the SPA site will not occur.
Change to key elements of the site.	None.
Describe from the above those elements of the Proposed Development or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	The main element of potential concern with regard to the designation features of the site is the collision risk for wintering swans that use the site for at least part of the winter. Some of the birds that winter in the general vicinity of the Tyrone - Cavan Interconnector may overfly the proposed overhead line route however no regular flightlines have been identified. Individual birds may be at risk of collision, but this potential impact is considered de minimis in terms of the overall population, and will not result in a likely significant effect to the Conservation

Habitats Directive Draft Screening Matrix: Lough Swilly SPA	
	Objective of maintaining the favourable conservation condition of this species as it relates to the SPA. In accordance with the Habitats Directive (92/43/EEC) the likely effects from the Tyrone - Cavan Interconnector has been assessed and it has been concluded that no likely significant effects on the qualify features selection features of the Lough Swilly SPA or its conservation objectives are anticipated as a result of the Tyrone - Cavan Interconnector .

Table 7 Habitats Directive Draft Screening Matrix: Lough Oughter Complex SPA

Habitats Directive Draft Screening Matrix: Lough Oughter Complex SPA	
The Proposed Development	Detail of the Tyrone - Cavan Interconnector is presented in detail in Section 4. A summary is presented in Table 3.
Brief Description of the Natura 2000 Site	Lough Oughter and its associated loughs occupy much of the lowland drumlin belt in north and central Co. Cavan between Belturbet, Killashandra and Cavan town. This area comprises a maze of waterways, islands, small lakes and peninsulas. Lough Oughter, the largest lake in the site, is relatively shallow (maximum depth of 10 m) and considered to be a naturally eutrophic system. Its main inflowing rivers are the River Erne and the Annalee River, whilst the main outflow is the River Erne, which connects the lake to Upper Lough Erne and Lower Lough Erne to the north.
Assessment Criteria	
Describe the individual elements of the Proposed Development (either alone or in combination with other plans or Proposed Developments) likely to give rise to impacts on the Natura 2000 site.	The construction, operation and eventual decommissioning (if required) of the Tyrone - Cavan Interconnector will not impact the Natura 2000 site or alter the habitats within its boundary. The potential for any impacts on the Lough waters, 43 km to the south west, is negligible. Potential impacts on SPA site features would be confined to the collision risk for birds that use the site as a wintering or staging area, and which may cross the proposed overhead line route on migration or commuting flights. A series of wintering bird surveys monitored the movements of birds within the Blackwater Valley and concluded that the overhead line does not present a likely significant effect to the whooper swans population in the valley.
Describe any likely direct, indirect or secondary impacts of the Proposed Development (either alone or in combination with other plans or Proposed Developments) on the Natura 2000 site by virtue of:	
Size and scale	None of the works will take place within the European Site.
Land-take	There will not be any land take from the SPA.
Distance from the Natura 2000 site or key features of the site	The Tyrone - Cavan Interconnector is approximately 43km to the north east of the SPA. Whooper swans which may use the SPA as a wintering/staging area may also frequent the Blackwater River valley and a site at Derryscollop as well as traveling to sites north and west of the development. The nearest known wintering site for swans is at Edenderry Lough, 1km to the west of the proposed line, although this has been rarely, if at all, used in the past five years. Birds wintering in the Blackwater River valley use sites ~4km to the west of the line and Derryscollop is 3km to the east. Swans have been seen feeding on two occasions in the past 5years under overhead lies at Clonbeg, around 1km to the east of the proposed pond location.
Resource requirements (water abstraction etc)	No abstraction will take place as a result of the Tyrone - Cavan Interconnector.

Habitats Directive Draft Screening Matrix: Lough Oughter Complex SPA	
Emissions (disposal to land, water or air)	There will be localised excavation for tower bases, remote from the site. Excavations for the substation will be extensive, but also remote from the site. In all cases the potential for accidental emissions to water and dewatering of the excavations required for foundations has been examined and the pollution control measures to address these issues are an integral part of the site Environmental Management Plan.
Excavation requirements	There will be localised excavation for tower bases, remote from the site. Excavations for the substation will be extensive, but also remote from the site.
Transportation requirements	The management of the transport of excavated material will take place according to the CEMP. Plant and materials will be delivered to site (substation and tower sites) by lorry.
Duration of construction, operation, decommissioning etc	It is anticipated that the longest period of construction would be for the overhead line part of the Tyrone - Cavan Interconnector. This will take 2 to 3 years to complete. The lifespan of the Tyrone - Cavan Interconnector is intended to be extended beyond its 50-80 year design life, if required, depending on its condition and refurbishments and depending on the transmission network requirements. It is likely that the effects of decommissioning would be temporary and of a similar scale or less than the construction phase.
Other	None
Describe any likely changes to the site arising as a result of:	
Reduction in habitat area;	The Tyrone - Cavan Interconnector will not lead to any reduction in habitat areas in the SPA site.
Disturbance to key species;	The potential impact of whooper Swan collisions with the overhead line is not considered significant due to its orientation, the location of feeding/staging sites within the locality and the number of birds likely to be present in the airspace.
Habitat or species fragmentation;	There will be no habitat or species fragmentation as a result of the Tyrone - Cavan Interconnector.
Reduction in species density;	No reduction in species density is anticipated.
Changes in key indicators of conservation value (water quality etc);	No changes to the key indicators of conservation value are anticipated.
Climate change.	The Tyrone - Cavan Interconnector will have a no significant impact on climate change in terms of emissions as a result of construction activities. One of the main reasons that this development is required is to facilitate the development of renewable power generation – by strengthening the flexible exchange of power flows over a large area of the island of Ireland. This will enable the connection and operation of larger volumes of renewable power generation (especially wind-powered generation) throughout the island and in turn help to facilitate meeting targets for renewable generation.

Habitats Directive Draft Screening Matrix: Lough Oughter Complex SPA	
Describe any likely impacts on the Natura 2000 site as a whole in terms of:	
Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	Whooper swans that may use the site and are part of the designation population may cross the route of the proposed overhead line to wintering grounds in the Blackwater River valley and areas further south. Birds using the valley are generally site-faithful and are at low risk of collision with the line. A series of wintering bird surveys conducted over 3 years monitored the movements of birds within the Blackwater Valley and found that the Tyrone - Cavan Interconnector is not considered to have likely significant effects on the SPA. A series of wintering bird surveys monitored the movements of birds within the Blackwater Valley and concluded that the overhead line does not present a likely significant effect to the whooper swans population in the valley
Provide indicators of significance as a result of the identification of effects set out above in terms of:	
Loss;	The Tyrone - Cavan Interconnector will not lead to a loss of any of the SPA area and does not involve any land take of the site.
Fragmentation;	The Tyrone - Cavan Interconnector will not result in any fragmentation of relevant habitats or populations.
Disruption;	It is expected that the numbers of whooper swan collisions with overhead line will be minimal based on survey results and consultation. The orientation and location of the Tyrone - Cavan Interconnector and the small numbers of whooper swans recorded in the airspace of the Tyrone - Cavan Interconnector would indicate that potential impact of whooper swan collisions with the overhead line would be negligible and therefore of no likely significance.
Disturbance;	Due to the distance of the proposed development from this European site, no conceivable disturbance of relevant habitats or populations within the SPA site could occur as a result of the implementation of the Tyrone - Cavan Interconnector.
Change to key elements of the site.	None.
Describe from the above those elements of the Proposed Development or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	Some of the birds that winter in the general vicinity of the Tyrone - Cavan Interconnector (Blackwater River valley, Derryscollop, Keady Lakes) may overfly the proposed overhead line route however no regular flightlines have been identified . Individual birds may be at risk of collision, but this potential impact is considered *de minimis* in terms of the overall population, and will not result in a likely significant effect to the Conservation Objective of maintaining the favourable conservation condition of this species as it relates to the SPA. In accordance with the Habitats Directive (92/43/EEC) the likely effects from the Tyrone - Cavan Interconnector has been assessed and it has been concluded that no likely significant effects on the qualify features selection features of the Lough Oughter Complex SPA or its conservation objectives are anticipated as a result of the Tyrone - Cavan Interconnector

Tables 8 - 12 summarise the conclusions to inform the Screening determination for each of the five European sites under consideration. In terms of the assessment of Likely Significant Effects on the European Sites under consideration, certain facts are relevant to all sites and this information is presented prior to the presentation of the Finding of No Significant Effects Matrices.

DATA COLLECTED TO CARRY OUT THE ASSESSMENT			
Who carried out the assessment?	Sources of data	Level of assessment completed	Where can the full results of the assessment be accessed and viewed?
SONI and its consultants	JNCC Site Descriptions for UK Sites NPWS for Sites located in RoI Reports prepared as part of the EIA of the Tyrone - Cavan Interconnector (see the Consolidated ES).	Screening	Draft assessment published as part of the Consolidated ES. This document is published as part of an addendum to the Consolidated ES.

Table 8 Conclusions to inform Screening Determination for HRA: Lough Neagh and Lough Beg Ramsar Sites

Habitats Directive Finding of No Significant Effects Matrix: Lough Neagh and Lough Beg Ramsar Site	
Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	Projects taken into account are as follows: • The extension to the Tyrone – Cavan Interconnector which extends into the RoI (North-South 400kV Interconnection Development); • Tamnamore to Omagh 110kV network reinforcement project; and, • Other small developments including wind turbines. Any potential In-combination effects arising from the North-South 400kV Interconnector Development would be largely restricted to a potential increase in collision mortality of whooper swan (a designated feature of assessed sites). Migratory movements into and out of Lough Neagh and Lough Beg SPA have been identified as likely occurring parallel to the proposed interconnector development and thus the overall development does not pose a significant risk to the dispersing population of this site. In-design mitigation comprising of bird flight diverters at specific locations along the NI and ROI overhead line will further reduce the potential for local bird population (non-SPA) collisions. Tamnamore to Omagh 110kV development is carried on wooden poles that range from 12m to 22m in height, with the majority less than 15m in height, and is unlikely to have a measureable impact on the whooper swan populations of European sites (RPS 2011). Other developments are small scale projects that are either wind turbines are low level developments. Wind Turbines have been shown by research to pose a low collision risk to whooper swan and not considered a likely source of in-combination effects with this development. For reference the small developments including wind turbines are presented in Annex E.
The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	The Tyrone - Cavan Interconnector is 8.6km from the Ramsar site, and no direct impacts will occur to the Natura 2000 site. Potential indirect effects that have been taken into consideration are: – During its construction phase, when sediments may be released into a water course leading into the site. There is a consequent potential for sediments to be discharged into the site, with resulting siltation impacts on site features. – There is a potential risk of sediment laden water overflowing the SuDS pond and entering watercourses that drain eventually into Lough Neagh, with potential impacts on feeding habitats of designation feature wildfowl. – There is a risk of collision with overhead lines for whooper swans that use the Ramsar site if birds cross the line route when arriving at/departing from wintering sites, or when on migration. – There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the Ramsar site, for example whooper swans, which may increase the risk of collision with nearby overhead lines.

Habitats Directive Finding of No Significant Effects Matrix: Lough Neagh and Lough Beg Ramsar Site	
Explain why these effects are not considered significant.	The Tyrone - Cavan Interconnector has been designed to minimise all forms of water pollution. The SuDS proposed drainage system will provide multiple barriers to treat runoff before it is discharged from the substation site and will have no significant effects and has been dealt with above. There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the Ramsar Site, for example whooper swans, which may increase the risk of collision with nearby overhead lines. In-design mitigation of bird flight diverters at the northern end of the route will mitigate for the potential individuals that may be at collision risk. Whooper swans that use wintering sites in the Blackwater River valley, Derryscollop or Keady Lakes areas are in the main site faithful and have not been observed crossing the proposed line route. A wintering bird survey has been carried out as part of the Environmental Impact Assessment of the Tyrone - Cavan Interconnector. The resultant report is the Wintering Swan Survey Report. The surveys indicated that the species most at risk from collision, whooper swan, does not routinely cross the overhead line route during the winter months. Potential collisions of individual birds at other times will not significantly affect the population status of the species in the SPA. Whilst it is considered that there will be minimal collisions post mitigation, the number of collisions will not approach the numbers that are required at the population level to have a significant effect , which have been modelled to require annual removal of greater than 3% of a population of whooper swans (Trinder, 2012). As such, it is considered that there will be no likely significant effects.
	Ramsar Selection Features **Test of Significance** RAMSAR CRITERION 1 A particularly good representative example of natural or near-natural wetlands, common to more than one biogeographic region. The site is the largest freshwater lake in the United Kingdom. Lough Neagh a relatively shallow body of water supporting beds of submerged aquatic vegetation fringed by associated species-rich damp grassland, reedbeds, islands, fens, marginal swampy woodland and pasture. Other interesting vegetation types include those associated with pockets of cut-over bog, basalt rock outcrops and boulders, and the mobile sandy shore. **The Tyrone - Cavan Interconnector is remote from the Ramsar site and habitat features will not be impacted as a result of the Tyrone - Cavan Interconnector.** RAMSAR CRITERION 2 Supports an appreciable assemblage of rare, vulnerable or endangered species or sub-species of plant or animal or an appreciable number of individuals of any one of these species. The site supports over 40 rare or local vascular plants which have been recorded for the site since 1970; the most notable are eight-stamened waterwort, marsh pea, Irish lady's tresses, alder buckthorn, narrow small-reed and holy grass. The Lough

Habitats Directive Finding of No Significant Effects Matrix: Lough Neagh and Lough Beg Ramsar Site	
	and its margin are also home to a large number of rare or local invertebrates, including two aquatic and two terrestrial molluscs, a freshwater shrimp *Mysis relicta*, eight beetles, five hoverflies, seven moths and two butterflies. Of the rare beetles recorded two, *Stenus palposus* and *Dyschirius obscurus,* have their only known Irish location around the Lough. The Lough also supports twelve species of dragonfly. **Small-scale accidental sediment discharges will be deposited or diluted before reaching the Lough, and will not have a significant effect on terrestrial or aquatic components of the site ecology.** RAMSAR CRITERION 3 This site is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna. The site regularly supports substantial numbers of individuals from particular groups of waterfowl which are indicative of wetland values, productivity and diversity. In addition, this site is of special value for maintaining the genetic and ecological diversity of Northern Ireland because of the quality and peculiarities of its flora and fauna. A large number of plants and animal species are confined or almost confined to this area within Northern Ireland. **The Tyrone - Cavan Interconnector is remote from the Ramsar site and habitat and species features will not be impacted as a result of the Tyrone - Cavan Interconnector.** RAMSAR CRITERION 4 This site is of special value as the habitat of plants or animals at a critical stage of their biological cycles. The site supports an important assemblage of breeding birds including the following species with which occur in nationally important numbers: great crested grebe, gadwall, pochard, tufted duck, snipe and redshank. Other important breeding wetland species include shelduck, teal, shoveler, lapwing and curlew. **The Tyrone - Cavan Interconnector is remote from the Ramsar site and habitat/species features will not be impacted as a result of the Tyrone - Cavan Interconnector** RAMSAR CRITERION 5 Assemblages of international importance: Species with peak counts in winter: 86639 waterfowl (5 year peak mean 1998/99-2002/2003) **Small-scale accidental sediment/pollutant discharges will be deposited or diluted before reaching the Lough, and will not affect the supporting habitats (aquatic and terrestrial) of the waterfowl assemblage. Birds such as whooper swan that could disperse form this site to other sites will not be significantly affected as described previously.**

Habitats Directive Finding of No Significant Effects Matrix: Lough Neagh and Lough Beg Ramsar Site	
	RAMSAR CRITERION 6 Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: Bewick's swan , , NW Europe 26 individuals, representing an average of 0.1% of the all-Ireland population (5 year peak mean 1998/9-2002/3) Species with peak counts in winter: Whooper swan, Iceland/UK/Ireland 1523 individuals, representing an average of 7.2% of the population (5 year peak mean 1998/9-2002/3) common pochard, NE & NW Europe 20279 individuals, representing an average of 5.7% of the population (5 year peak mean 1998/9-2002/3) Tufted duck, NW Europe 17807 individuals, representing an average of 1.4% of the population (5 year peak mean 1998/9-2002/3) Greater scaup , , W Europe 3377 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3) Common goldeneye, NW & C Europe 6645 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3) **Small-scale accidental sediment/pollutant discharges will be deposited or diluted before reaching the Lough, and will not affect the supporting habitats (aquatic and terrestrial) of the waterfowl assemblage. Birds such as whooper swan that could disperse form this site to other sites will not be significantly affected as described previously.** Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in spring/autumn: Great cormorant, NW Europe 1628 individuals, representing an average of 1.3% of the population (5 year peak mean 1998/9-2002/3) Mute swan *Cygnus olor*, Britain 1,874 individuals, representing an average of 4.9% of the population (5 year peak mean 1998/9-2002/3) **Small-scale accidental sediment/pollutant discharges will be deposited or diluted before reaching the Lough, and will not affect the supporting habitats (aquatic and terrestrial) of the waterfowl assemblage. Birds such as whooper swan that could disperse form this site to other sites will not be significantly affected as described previously.**

Table 9 Conclusions to inform Screening Determination for HRA: Lough Neagh and Lough Beg SPA

Habitats Directive Finding of No Significant Effects Matrix: Lough Neagh and Lough Beg SPA	
Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	The following projects have been taken into account: – The extension to the Tyrone – Cavan Interconnector which extends into the RoI (North-South 400kV Interconnection Development); – Tamnamore to Omagh 110kV network reinforcement project; and, – Other small developments including wind turbines. Any potential In-combination effects arising from the North-South 400kV Interconnection Development would be largely restricted to a potential to increase collision mortality of whooper swan (a designated feature of assessed sites). Migratory movements into and out of Lough Neagh and Lough Beg SPA have been identified as likely occurring parallel to the proposed interconnector development and thus the overall development does not pose a significant risk to the dispersing population of this site. In-design mitigation comprising of bird flight diverters at specific locations along the NI and ROI overhead line will further reduce the potential for local bird population (non-SPA) collisions. Tamnamore to Omagh 110kV development is carried on wooden poles that range from 12m to 22m in height, with the majority less than 15m in height, and is unlikely to have a measureable impact on the whooper swan populations of European sites (RPS 2011). Other developments are small scale projects that are either wind turbines are low level developments. Wind Turbines have been shown by research to pose a low collision risk to whooper swan and not considered a likely source of in-combination effects with this development. For reference the small developments including wind turbines are presented in Annex E.
The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	It has been established that the Tyrone - Cavan Interconnector will not directly affect the SPA. – The following potential indirect effects during construction have been considered, when sediments may be released into a water course leading into the site. There is a consequent potential for sediments to be discharged into the site, with resulting siltation impacts on site features. – There is a potential risk of sediment laden water overflowing the SuDS pond and entering watercourses that drain eventually into Lough Neagh, with potential impacts on feeding habitats of designation feature wildfowl. – There is a risk of collision with overhead lines for whooper swans that use the Ramsar site if birds cross the line route when arriving at/departing from wintering sites, or when on migration. – There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the Ramsar site, for example whooper swans, which may increase the risk of collision with nearby overhead lines.

Habitats Directive Finding of No Significant Effects Matrix: Lough Neagh and Lough Beg SPA	
Explain why these effects are not considered significant.	The SuDS proposed drainage system will provide multiple barriers to treat runoff before it is discharged from the site and will have no significant effects and has been dealt with above. There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the SPA, for example whooper swans, which may increase the risk of collision with nearby overhead lines. In-design mitigation of diverters at the northern end of the route will mitigate for the potential individuals that may be at collision risk. In-design mitigation of bird flight diverters between Towers 1 and 13, and Towers 30 and 43 at the northern end of the scheme. The use of bird flight diverters which will be erected at the most likely crossing point for swans have been shown to significantly reduce collision risk (Frost, 2008). Recent surveys indicate that the species most at risk from collision, whooper swan, does not routinely cross the overhead line route during the winter months. Potential collisions of individual birds will represent a likely significant effect on the population status of the species in the SPA. Whooper swans that use wintering sites in the Blackwater River valley, Derryscollop or Keady Lakes areas are in the main site faithful and have not been observed crossing the proposed line route. There remains the potential for birds to cross the route, particularly when entering or leaving the valley, however due to the population scale on the SPA, there will be no likely significant effect. Whilst it is considered that there will be minimal collisions post mitigation, the number of collisions will not approach the numbers that are required at the population level to have a significant effect. Modelling has indicated that an annual removal of greater than 3% of a population of whooper swans would need to occur to result in significant effect (Trinder, 2012). As such, it is considered that there will be no likely significant effects. Qualifying features are considered individually below.
SPA Selection Features	Assessment Rationale
ARTICLE 4.1 QUALIFICATION (*2009/147/EC*) During the breeding season the area regularly supports: Common tern Over winter the area regularly supports: Bewick's swan Whooper swan	During the breeding season the area regularly supports: Common tern (Northern/Eastern Europe - breeding) 6% of the all-Ireland breeding population Count, as at 1995 Over winter the area regularly supports: Bewick's swan (Western Siberia/North-eastern & North-western Europe) 5.4% of the all-Ireland population 5 year peak mean 1991/92-1995/96 Whooper swan (Iceland/UK/Ireland) 10% of the all-Ireland population 5 year peak mean 1991/92-1995/96 Common tern is not considered a collision risk. Bewick's swan is now a rare species in Northern Ireland, and rarely recorded in the vicinity of the Tyrone – Cavan Interconnector. Recent surveys indicate that the species most at risk from collision, whooper swan, does not

Habitats Directive Finding of No Significant Effects Matrix: Lough Neagh and Lough Beg SPA	
	routinely cross the overhead line route during the winter months. Potential collisions of individual birds at other times will not significantly affect the population status of the species in the SPA Whilst it is considered that there will be minimal collisions post mitigation, the number of collisions will not approach the numbers that are required at the population level to have a significant effect. Modelling has indicated that an annual removal of greater than 3% of a population of whooper swans would need to occur to result in significant effect (Trinder, 2012). As such, it is considered that there will be no likely significant effects. In-design mitigation of diverters between Towers 1 and 13, and Towers 30 and 43 at the northern end of the scheme has also been included to prevent bird collisions. The use of bird flight diverters which will be erected at the most likely crossing point for swans have been shown to significantly reduce collision risk (Frost, 2008).
ARTICLE 4.2 QUALIFICATION (*2009/147/EC*) Over winter the area regularly supports: Pochard Tufted duck Goldeneye	Pochard (North-western/North-eastern Europe) 7.5% of the population 5 year peak mean 1991/92-1995/96 Tufted duck (North-western Europe) 2.2% of the population 5 year peak mean 1991/92-1995/96 Goldeneye (North-western/Central Europe) 3.6% of the population 5 year peak mean 1991/92-1995/96 It is not anticipated that these species will cross the overhead line route in significant numbers. Their migration routes to Lough Neagh have been recorded as coming from the north and east, and birds therefore do not enter Interconnector airspace.
ARTICLE 4.2 QUALIFICATION (*2009/147/EC*): An Internationally Important Assemblage Of Birds	Over winter the area regularly supports: 99,262 waterfowl (5 year peak mean 01/04/1998) Including: Bewick's swan, whooper swan, pochard, tufted duck and goldeneye. Birds included in this assemblage that routinely use the vicinity of the Tyrone - Cavan Interconnector are restricted to whooper swans. The reasons for no significant effects have already been outlined

Table 10 Habitats Directive Finding of No Significant Effects Matrix: Lough Foyle SPA

Habitats Directive Finding of No Significant Effects Matrix: Lough Foyle SPA	
Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	The following projects have been taken into account: • The extension to the Tyrone – Cavan Interconnector which extends into the RoI (North-South 400kV Interconnection Development); • Tamnamore to Omagh 110kV network reinforcement project; and, • Other small developments including wind turbines. Any potential In-combination effects arising from the North-South 400kV Interconnection Development would be largely restricted to a potential to increase collision mortality of whooper swan (a designated feature of assessed sites). This site is not impacted by either development and no significant effects are considered likely to occur to the SPA population of whooper swan in the event that individual birds move between SPA sites and onto smaller local overwintering grounds in the vicinity of the overhead line. Migratory movements of birds between SPA sites of Lough Foyle and Lough Neagh and Lough Beg SPA and onward dispersion to overwintering sites south of these sites have been identified as likely occurring parallel to the proposed interconnector development and thus the overall development does not pose a significant risk to the dispersing population of this site. In-design mitigation comprising of bird flight diverters at specific locations along the NI and ROI overhead line will further reduce the potential for local bird population (non-SPA) collisions. Tamnamore to Omagh 110kV development is carried on wooden poles that range from 12m to 22m in height, with the majority less than 15m in height, and is unlikely to have a measureable impact on the whooper swan populations of European sites (RPS 2011). Other developments are small scale projects that are either wind turbines are low level developments. Wind Turbines have been shown by research to pose a low collision risk to whooper swan and not considered a likely source of in-combination effects with this development. For reference the small developments including wind turbines are presented in Annex E.
The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	Due to the remoteness of the site from the proposed development and lack of hydrological connectivity, any potential effects are restricted to those that are related to the bird assemblages. – There is a risk of collision with overhead lines for whooper swans that use the Ramsar site if birds cross the line route when arriving at/departing from wintering sites, or when on migration. – There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the Ramsar site, for example

Habitats Directive Finding of No Significant Effects Matrix: Lough Foyle SPA	
	whooper swans, which may increase the risk of collision with nearby overhead lines.
Explain why these effects are not considered significant.	There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the SPA, for example whooper swans, which may increase the risk of collision with nearby overhead lines. In-design mitigation of diverters at the northern end of the route will mitigate for the potential individuals that may be at collision risk. Recent surveys indicate that the species most at risk from collision, whooper swan, does not routinely cross the overhead line route during the winter months. Potential collisions of individual birds at other times will not significantly affect the population status of the species in the SPA. Whooper swans that use wintering sites in the Blackwater River valley, Derryscollop or Keady Lakes areas are in the main site faithful and have not been observed crossing the proposed line route. There remains the potential for birds to cross the route, particularly when entering or leaving the Blackwater River valley, however due to the population scale on the SPA; a significant impact is not anticipated. In-design mitigation of diverters between Towers 1 and 13, and Towers 30 and 43 at the northern end of the scheme will be used. The use of bird flight diverters which will be erected at the most likely crossing point for swans have been shown to significantly reduce collision risk (Frost, 2008). Whilst it is considered that there will be minimal collisions post mitigation, the number of collisions will not approach the numbers that are required at the population level to have a significant effect. Modelling has indicated that an annual removal of greater than 3% of a population of whooper swans would need to occur to result in significant effect (Trinder, 2012). As such, it is considered that there will be no likely significant effects. Qualifying features are considered individually below.
SPA Selection Features	Assessment Rationale
ARTICLE 4.1 QUALIFICATION (*2009/147/EC*) Regularly supporting, in winter, internationally important numbers of: Whooper swan Bar-tailed godwit Bewick's swan Golden plover	The European Site regularly supports in winter, internationally important numbers of: Whooper swan (the five year peak mean period 1991/92 to 1995/96 was 890, which comprises 5.6% of the international population); Bewick's swan, 78 individuals representing 3.1% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6); and, Bar-tailed godwit (the five year peak mean period 1991/92 to 1995/96 was 1,896, which comprises 5.6% of the international population). Golden Plover, 4,891 individuals representing 2.4% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6) Of these three species only whooper swan could have any tentative association with the area of the proposed development. Migration or dispersion of whooper swan from this SPA to other wintering sites south of Lough Neagh and Lough Beg could occur,

Habitats Directive Finding of No Significant Effects Matrix: Lough Foyle SPA	
	potentially bringing birds into the vicinity of the route of the Tyrone – Cavan Interconnector. The small numbers of birds that are likely to be from the Foyle SPA is highly unlikely to be affected by the development. In addition, the provision of In-design mitigation of diverters between Towers 1 and 13, and Towers 30 and 43 at the northern end of the scheme further reduces the likelihood of individual collisions. The use of bird flight diverters which will be erected at the most likely crossing point for swans (and other bird species) have been shown to significantly reduce collision risk (Frost, 2008).
ARTICLE 4.2 QUALIFICATION (*2009/147/EC*): Light-bellied brent goose	The site qualifies by supporting populations of European importance of the following migratory species: Over winter; Light-bellied Brent goose, 3,730 individuals representing 18.6% of the wintering Canada/Ireland population (5 year peak mean 1991/2 - 1995/6). Light-bellied brent geese will move between feeding sites during the winter in Ireland but during survey conducted on eleven occasions, between November 2007 and March 2008, during January 2008 and April 2008, during October and November 2008, and during March 2009, December 2010 and on February 2011, this species was not recorded in the study area. Its likely absence in the area indicates that the overhead lines will not result in a likely significant effect.
ARTICLE 4.2 QUALIFICATION (*2009/147/EC*): An Internationally Important Assemblage Of Birds	The site also qualifies under Article 4.2 of the Directive by supporting over 20,000 migratory waterfowl. This total includes both the internationally important species listed above and the following waterfowl species which are nationally important in an all-Ireland context: Red-throated diver, great crested grebe, mute swan, greylag geese, shelduck, teal, mallard, wigeon, eider, red-breasted merganser, oystercatcher, grey plover, lapwing, knot, dunlin, curlew, redshank and greenshank. Of these species most have not been recorded in the vicinity of the Tyrone - Cavan Interconnector during surveys. Due to the remoteness of the site there is unlikely to be a significant effect. Many of these species are likely to be restricted to vicinity of the SPA during the breeding season (where relevant). Other sensitive qualifying interests common to the SPA and the study area occur at low numbers. Given the low and very localised scale of flight activity of whooper swan, distance from the SPA, and lack of connectivity, there will be no impacts to these species. This SPA is remote from the development area and the presence of the transmission line will not constitute a significant risk to the bird populations of Lough Foyle SPA from the Tyrone - Cavan Interconnector alone or in-combination with other plans and projects, with the exception of whooper Swan, However, the bird surveys conducted for the Tyrone - Cavan Interconnector Environmental Statement indicated that there is limited number of whooper swans crossing the overhead line, and this passage would generally be in the vicinity of the Blackwater at the north of the site. The use of bird flight diverters which will be erected at the most likely crossing point for swans have been shown to significantly reduce collision risk (Frost, 2008).

Table 11 Habitats Directive Finding of No Significant Effects Matrix: Lough Swilly SPA

Habitats Directive Finding of No Significant Effects Matrix: Lough Swilly SPA	
Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	The following projects have been taken into account: – The extension to the Tyrone – Cavan Interconnector which extends into the RoI (North-South 400kV Interconnection Development); – Tamnamore to Omagh 110kV network reinforcement project; and, – Other small developments including wind turbines. Any potential In-combination effects arising from the North-South 400kV Interconnection Development would be largely restricted to a potential to increase collision mortality of whooper swan (a designated feature of assessed sites). This site is not impacted by either development and no significant effects are considered likely to occur to the SPA population of whooper swan in the event that individual birds move between SPA sites and onto smaller local overwintering grounds in the vicinity of the overhead line. Any migratory movements of whooper swan to and from the staging site of Lough Swilly SPA between Lough Neagh and Lough Beg SPA and on to non-designated wintering sites to the south have been identified as likely occurring parallel to the proposed interconnector development and thus the overall development does not pose a significant risk to the dispersing population of this site. In-design mitigation comprising of bird flight diverters at specific locations along the NI and ROI overhead line will further reduce the potential for local bird population (non-SPA) collisions. Tamnamore to Omagh 110kV development is carried on wooden poles that range from 12m to 22m in height, with the majority less than 15m in height, and is unlikely to have a measureable impact on the whooper swan populations of European sites (RPS 2011). Other developments are small scale projects that are either wind turbines are low level developments. Wind Turbines have been shown by research to pose a low collision risk to whooper swan and not considered a likely source of in-combination effects with this development. For reference the small developments including wind turbines are presented in Annex E.
The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	Due to the remoteness of the site and lack of hydrological connectivity, effects are restricted to those that are related to the bird assemblages. – There is a risk of collision with overhead lines for whooper swans that use the Ramsar site if birds cross the line route when arriving at/departing from wintering sites, or when on migration. – There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the Ramsar site, for example whooper swans, which may increase the risk of collision with nearby overhead lines.

Habitats Directive Finding of No Significant Effects Matrix: Lough Swilly SPA	
Explain why these effects are not considered significant.	There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the SPA, for example whooper swans, which may increase the risk of collision with nearby overhead lines. In-design mitigation of diverters at the northern end of the route will mitigate for the potential individuals that may be at collision risk. Recent surveys indicate that the species most at risk from collision, whooper swan, does not routinely cross the overhead line route during the winter months. Potential collisions of individual birds at other times will not significantly affect the population status of the species in the SPA. Whooper swans that use wintering sites in the Blackwater River valley, Derryscollop or Keady Lakes areas are in the main site faithful and have not been observed crossing the proposed line route. There remains the potential for birds to cross the route, particularly when entering or leaving the Blackwater River valley, however due to the population scale on the SPA; a significant impact is not anticipated. In-design mitigation of diverters between Towers 1 and 13, and Towers 30 and 43 at the northern end of the scheme will be used. The use of bird flight diverters which will be erected at the most likely crossing point for swans have been shown to significantly reduce collision risk (Frost, 2008). Whilst it is considered that there will be minimal collisions post mitigation, the number of collisions will not approach the numbers that are required at the population level to have a significant effect. Modelling has indicated that an annual removal of greater than 3% of a population of whooper swans would need to occur to result in significant effect (Trinder, 2012). As such, it is considered that there will be no likely significant effects. Qualifying features are considered individually below.
SPA Selection Features	Assessment Rationale
Wintering waterfowl assemblage	Wintering waterfowl assemblage including the following species: Whooper swan, great crested grebe, greylag goose, grey heron, wigeon, teal, mallard, coot and curlew. Birds species included in this assemblage that could in theory interact with local overwintering populations in the vicinity of the Tyrone - Cavan Interconnector, or have migratory or dispersion routes to the South are restricted to whooper swans. The proposed development will not affect the overall assemblage numbers in the European Site in any way

Table 12 Habitats Directive Finding of No Significant Effects Matrix: Lough Oughter Complex SPA

Habitats Directive Finding of No Significant Effects Matrix: Lough Oughter Complex SPA	
Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	The following projects have been taken into account: – The extension to the Tyrone – Cavan Interconnector which extends into the RoI (North-South 400kV Interconnection Development); – Tamnamore to Omagh 110kV network reinforcement project; and, – Other small developments including wind turbines. Any potential In-combination effects arising from the North-South 400kV Interconnection Development would be largely restricted to a potential to increase collision mortality of whooper swan (a designated feature of assessed sites). This site is not impacted by either development and no significant effects are considered likely to occur to the SPA population of whooper swan in the event that individual birds move between SPA sites and onto smaller local overwintering grounds in the vicinity of the overhead line. In-design mitigation comprising of bird flight diverters at specific locations along the NI and ROI overhead line will further reduce the potential for local bird population (non-SPA) collisions. Tamnamore to Omagh 110kV development is carried on wooden poles that range from 12m to 22m in height, with the majority less than 15m in height, and is unlikely to have a measureable impact on the whooper swan populations of European sites (RPS 2011). Other developments are small scale projects that are either wind turbines are low level developments. Wind Turbines have been shown by research to pose a low collision risk to whooper swan and not considered a likely source of in-combination effects with this development. For reference the small developments including wind turbines are presented in Annex E.
The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	– There is a risk of collision with overhead lines for whooper swans that use the SPA site if birds cross the line route when arriving at/departing from wintering sites, or when on migration. – There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the SPA site, for example whooper swans, which may increase the risk of collision with nearby overhead lines.
Explain why these effects are not considered significant.	There is a potential for the SuDS pond to attract overflying wildfowl that are elements of the designation population of the SPA, for example whooper swans, which may increase the risk of collision with nearby overhead lines. In-design mitigation of diverters at the northern end of the route will mitigate for the potential individuals that may be at collision risk. Recent surveys indicate that the species most at risk from collision, whooper swan, does not routinely cross the overhead line route during the winter months. Potential collisions of individual birds at other times will not significantly affect the population status of the species in the SPA. Whooper swans that use wintering sites in the Blackwater River valley, Derryscollop or Keady Lakes areas are in the main site faithful and have not been observed crossing the proposed line route. There remains the potential for birds to

Habitats Directive Finding of No Significant Effects Matrix: Lough Oughter Complex SPA	
	cross the route, particularly when entering or leaving the Blackwater River valley, however due to the population scale on the SPA; a significant impact is not anticipated. In-design mitigation of diverters between Towers 1 and 13, and Towers 30 and 43 at the northern end of the scheme will be used. The use of bird flight diverters which will be erected at the most likely crossing point for swans have been shown to significantly reduce collision risk (Frost, 2008). Whilst it is considered that there will be minimal collisions post mitigation, the number of collisions will not approach the numbers that are required at the population level to have a significant effect. Modelling has indicated that an annual removal of greater than 3% of a population of whooper swans would need to occur to result in significant effect (Trinder, 2012). As such, it is considered that there will be no likely significant effects. Qualifying features are considered individually below.
SPA Selection Features	Assessment Rationale
Wintering: Whooper swan Wigeon. Breeding: Great crested grebe Wetlands and waterbirds	Internationally important numbers of whooper swan, nationally important numbers of wigeon, great crested grebe For wigeon, the site is distant and birds are unlikely to cross the proposed overhead line. Other water birds likely to be restricted to vicinity of the SPA during the breeding season With regards to the wetland habitat, The site is distant and in a different water catchment to the Tyrone - Cavan Interconnector and is therefore hydrologically isolated from the Tyrone - Cavan Interconnector. As with other European Sites, individual/ small numbers of whooper swans from this SPA population may in theory disperse and cross the route of the Tyrone – Cavan Interconnector as they move from this site to other staging/feeding sites. In this instance, Passage of birds would be minimal, and would not result in any feasible effect on the SPA population.

6.1 Conclusion of HRA Screening

It is concluded that all European sites detailed in this report have been correctly screened out or excluded from further consideration on the basis of objective information that the Tyrone - Cavan Interconnector, individually or in-combination with other plans or projects, will have no, or no appreciable, effects on those sites in view of their conservation objectives.

7 Information to Inform Appropriate Assessment

SONI and the consultants working on their behalf are confident that the construction and operation of the proposed Tyrone-Cavan Interconnector project will not result in likely significant effects on any European Site in view of Conservation Objectives. This determination is based on the objective information examined as part of the Screening for HRA and the inclusion of incorporated mitigation. However, it is acknowledged that SONI is not the Competent Authority in determining the outcomes of the HRA Assessment process. If the Competent Authority should wish to undertake an Appropriate Assessment, this report provides all the necessary information to allow them to do so.

7.1 Regulatory Context

The purpose of the Appropriate Assessment is to assess the implications of the Tyrone - Cavan Interconnector in respect of the sites 'conservation objectives, individually or in combination with other plans and projects. The conclusions should enable the Competent Authority to determine whether or not the Tyrone - Cavan Interconnector would adversely affect the integrity of any European Sites.

The purpose of the screening process was to identify European Sites on which there is the possibility of there being a significant effect from the Tyrone - Cavan Interconnector. Whilst the screening process found the development would not result in likely significant effects on any European Sites, five sites were examined in detail in view of their conservation objective to maintain or restore the favourable conservation status of whooper swan and water quality that supports the habitats of sites. Should the Competent Authority deem that that Appropriate Assessment is required based on their own Screening determination. It is likely to be these five sites assessed for impacts on site integrity.

Information is presented to allow an assessment on the integrity of the following European Sites in view of their conservation objectives:

- Lough Neagh and Lough Beg SPA;
- Lough Neagh and Lough Beg Ramsar;
- Lough Oughter Complex SPA (RoI);
- Lough Foyle SPA; and,
- Lough Swilly SPA (RoI).

7.2 Site Conservation Objectives Overview

The conservation objectives for individual sites focus on protection of the site designation features and any supporting site characteristics that are important for the conservation of those features. In general, objectives for European Sites call for the maintenance or restoration of designation features in favourable condition, together with expansion of feature habitats and species populations where appropriate.

The conservation objectives for European Sites which are SPAs focus on protection of the site designation features and any supporting site characteristics that are important for the conservation of those features. Objectives call for the maintenance of designation features in favourable condition. For sites that are designated for their wintering birds, favourable condition occurs when there is no significant decrease in population against national trends. For breeding birds, favourable condition requires fledging success to be sufficient to maintain or enhance the target population. Conservation objectives of European sites considered fully in this assessment are presented in Annex A.

Ramsar sites are generally coincident with SPA site boundaries and as such the conservation objectives for these sites also apply to the Ramsar designation.

7.3 Impacts and Threats to Northern Ireland Protected Sites

The diverse nature of Natura Sites in terms of locations and reasons for designation means that threats to designation features are also likely to be diverse. The main impacts and threats affecting the habitat interest features of sites, as identified by JNCC (2007), include a range of direct and indirect impacts. JNCC guidance (www.jncc.defra.gov.uk) requires all features of European importance (both primary and non-primary) to be considered when undertaking an HRA with regard to a site. The global conservation status of each designation feature is indicated for Northern Ireland, provided by NIEA (2013). As the Tyrone – Cavan Interconnector does not pass through or over any European Sites, only indirect impacts are considered i.e. those activities that may impact mobile species (whooper swans) and those that are may affect the sites water quality .

Table 13 summarises the European Sites Designation Feature(s), the approximate distance from the Tyrone – Cavan Interconnector, and a brief Description of the Designation feature including, for SPA sites, the Conservation Objectives.

Table 13: European sites under consideration

European sites under consideration			
Site	**Designation feature(s)**	**Distance from the Tyrone – Cavan Interconnector**	**Feature Description**
Lough Neagh and Lough Beg SPA	Breeding common tern; Breeding bird assemblage Wintering Bewick's swan, whooper swan (Annex I species) Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	8 km to substation 9 km to line route	During the breeding season the area regularly supports nationally important numbers of breeding common tern, and a nationally important assemblage of waterfowl. Over winter the area regularly supports internationally important numbers of Bewick's swan, whooper swan, pochard, tufted duck and goldeneye and nationally important numbers of 13 additional species of waterfowl. Over winter the area regularly supports 99,262 waterfowl. The Conservation Objectives for this site are: *To maintain each feature in favourable condition*
Lough Neagh and Lough Beg Ramsar	A particularly good representative example of natural or near-natural wetlands, common to more than one biogeographic region.	4km to substation 4km to line route	This site is the largest freshwater lake in the United Kingdom. Lough Neagh is a relatively shallow body of water supporting beds of submerged aquatic vegetation fringed by associated species-rich damp grassland, reedbeds, islands, fens, marginal swampy woodland and pasture. Other interesting vegetation types include those associated with pockets of cut-over bog, basalt rock outcrops and boulders, and the mobile sandy shore.

European sites under consideration			
Site	**Designation feature(s)**	**Distance from the Tyrone – Cavan Interconnector**	**Feature Description**
	Regularly supports internationally important numbers of wildfowl species and regularly supports nationally important numbers of breeding common tern.		Over winter the area regularly supports internationally important numbers of Bewick's and whooper swans. During the breeding season the area regularly supports nationally important numbers of breeding common tern,
	Supports an important assemblage of breeding birds		Supports nationally important numbers of breeding great crested grebe, gadwall, pochard, tufted duck, snipe and redshank.
	Supports a population of pollan		One of the few locations in Ireland and one of the two known locations in the UK for pollan.
Lough Oughter Complex SPA (RoI)	Wintering whooper swan (Annex I species), wigeon. Breeding great crested grebe Wetland and waterbirds	35km to closest point of Tyrone – Cavan Interconnector	Internationally important numbers of whooper swan, nationally important numbers of wigeon, great crested grebe. The Conservation Objectives for this site are *To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:*
Lough Foyle SPA	Wintering, whooper swan, bar-tailed godwit (Annex I species), light-bellied brent goose. Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	69km to closest point of Tyrone – Cavan Interconnector	Internationally important numbers of whooper swan, bar-tailed godwit, light-bellied brent goose. Nationally important numbers of a further 20 waterfowl species. The site acts as a staging post for, particularly, whooper swans before dispersal into Northern Ireland and RoI. The Conservation Objectives for this site are: *To maintain each feature in favourable condition.*

European sites under consideration			
Site	**Designation feature(s)**	**Distance from the Tyrone – Cavan Interconnector**	**Feature Description**
Lough Swilly SPA (RoI)	Wintering, whooper swan, Greenland white-fronted goose (Annex I species) and greylag goose. Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	78km to closest point of Tyrone – Cavan Interconnector	Internationally important numbers of whooper swan, Greenland white-fronted goose, greylag goose, nationally important numbers of a further 21 species. The site acts as a staging post for, particularly, whooper swans before dispersal into Northern Ireland and RoI. The Conservation Objectives for this site are: *To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Lough Swilly SPA, which is defined by the following list of attributes and targets (note that this objective relates to all waterbird species of Special Conservation Interest).*

This Section of the report presents the information to inform an Appropriate Assessment. It uses the baseline condition assessments, and considers the pressures and threats to European Site designation features, and assesses the potential impacts of the Tyrone – Cavan Interconnector (however unlikely to occur) and how these relate to overall site integrity.

7.4 Underlying Trends affecting Protected Sites

The trends affecting European sites are presented in terms of the condition of interest features. EC Member States must report at six-yearly intervals on measures taken and their outcome in terms of the conservation status of species and habitats listed on the Directive's Annexes. The latest reporting round for the Habitats Directive covered the period 2001-2006 (Williams ed. 2006). For the UK as a whole, the 2001-2006 reporting round found that 37% of assessments recorded favourable condition, 24% unfavourable-recovering and 38% other unfavourable. The degree of uncertainty applicable to the results recorded in this document has been assessed by NIEA, which has adopted a risk-based approach to assessment. Risk is defined as 'the risk to habitats and species of being adversely affected by pressures caused by human activities (NIEA 2010).

As highly mobile species, bird populations may be affected by factors not only in Northern Ireland, but also by those on their wintering or breeding grounds elsewhere, or along the routes between Northern Ireland and those breeding or wintering grounds. For those species that breed in northern and eastern regions of the Eurasian land mass and winter in Northern Ireland, there may be a 'short stopping' response to recent milder winter conditions on the near continent. This is particularly the case with some duck and wader species that are components of bird assemblage features of SPAs. Some wintering species, for example Bewick's swan, also appear to have reduced breeding success on their continental breeding grounds, which may also be a factor in reduced numbers in Northern Ireland. In general, there has been a decline in the numbers of wintering ducks derived from breeding populations in eastern Europe and Siberia, whilst wildfowl of Icelandic origin are generally stable (scaup) or increasing (whooper swan).

Unfavourable condition for the site features is attributed to:

- Lough Foyle – Population decline of Bewick's swan is part of a wider European pattern and is unlikely to be site-specific; and,
- Lough Neagh and Lough Beg – Decline of great crested grebe is a possible artefact of variable monitoring reliability, and is contrary to national trend (Baillie et al 2012). For Bewick's swan see above. Declines of pochard and tufted duck may result from changes in migration patterns. Unfavourable condition of the waterfowl assemblage is the result of associated declines in these two species.

From descriptions of potential impacts on SAC, SPA and Ramsar site designation features, it is clear that there are many situations in which infrastructure schemes have the potential to adversely affect the features and conservation objectives of European sites.

The interest features of European sites may be in favourable or unfavourable condition, but management of these internationally important sites is designed to produce universally favourable condition at some point in the future, in line with site conservation objectives. The Tyrone – Cavan Interconnector should not contribute to, or cause, the unfavourable condition of these designation features, and should at least be neutral in its effects on the condition of the features.

The standard mitigation (i.e. that mitigation included in the design) for ameliorating potential adverse effects on the conservation objectives of designated sites is presented, which then allows for the determination of adverse effects.

7.5 In-Design Mitigation

Mitigation measures include actions that will lead to avoidance of potential impacts on European sites, their conservation objectives and their designation features (see Consolidated ES for proposed standard mitigation measures – an outline is provide in this report and the Outline CEMP is provided as Annex D). Since the publication of the Consolidated ES, bird flight diverters on an additional length of the overhead line (i.e. between Towers 1 and 13), has also been prescribed. Thus bird flight diverters which have been shown in the scientific research to significantly reduce possible collisions will be installed from Towers 1- 13 and Towers 30 to 43.

The project level mitigation measures outlined in the Consolidated ES are considered to be "best practice" (e.g. CIRIA guidance has been applied) and are measures which have been routinely and successfully applied for other projects.

The mitigation measures at the northern end of the scheme (bird flight diverters between Towers 1 to 13 and Towers 30 to 43) will further reduce the potential for collisions by whooper swans with the overhead line. It is considered that there will be minimal collisions post mitigation, and certainly not enough to approach the adverse effects at the population level which have been modelled to require annual removal of greater than 3% of a population of whooper swans (Trinder, 2012).

As best practice, post construction monitoring is also proposed. The overhead line will be monitored for collision casualties post-construction, and modifications to diverter type and location arising from monitoring observations will be put in place if required. Monitoring is included as best practice only, as following this standard mitigation casualties are not expected.

A watching brief will be kept and modifications made to maintain or enhance its effectiveness.

- Regular post construction survey to identify collision cadavers along the overhead line route.
- Encouragement of local landowners to report casualties.

7.6 Impacts to Mobile Species Moving Between Designated Sites

Potential effects on the integrity of designated sites arising from the Tyrone – Cavan Interconnector and its extension into RoI would be restricted to a potential to increase collision mortality of whooper swan (a designated feature of the assessed sites). This species has poor manoeuvrability and forward vision, increasing its vulnerability to poorly marked flight obstacles, yet travels

long distances. Birds frequently make twice-daily flights between feeding and roosting sites in very low light conditions, which could lead to an increase collision risk where overhead lines are present. However, it should be noted that large numbers of swans from the Lough Neagh population forage in the immediate vicinity of such existing lines and their associated towers in other areas, not associated with the Tyrone - Cavan Interconnector with apparently no significant effects. In fact, the whooper swan population is increasing (Trinder, 2012). Commuting flights of this nature are unlikely to occur along the length of the Tyrone – Cavan Interconnector in Northern Ireland, because known traditional foraging grounds and their associated roost sites in the vicinity are either on the same side of the line, and therefore do not require transits across the line route, or flightlines are oriented so that they pass beyond the northern end of the Tyrone – Cavan Interconnector.

There is a potential collision risk for wintering swans that use feeding sites on both sides of the border. However, the numbers using the Blackwater catchment in the RoI are generally restricted to 20-40 birds (Crowe, 2005), and birds using the lakes of south Armagh are also generally present in very small numbers. However, sightings of marked birds confirm that birds that use the Keady lakes may spend part of each winter in the Lough Foyle and Lough Swilly SPAs, and are therefore part of the designation feature for those sites. They may also use sites in the RoI during the same winter (see Consolidated ES). The impact on swans that may use sites on both sides of the border is seen to be negligible in terms of adverse effects upon the integrity of the designated sites.

However, it is likely that non-regular flights will take place across the Tyrone – Cavan Interconnector route, with an increased potential for collision limited to birds making those flights. As well as commuting trips as described above, whooper swans also make longer distance movements between breeding quarters or migration staging areas and their final wintering grounds. There is a potential for birds moving between Lough Neagh and wintering sites in RoI to cross the line of the Tyrone – Cavan Interconnector, particularly towards the northern end of the line. In this respect, birds that may make a direct flight between Lough Neagh and the Lough Oughter Complex SPA will cross the northern part of the interconnector route. However, birds that may use this route already cross an existing 275kV line to the north of Moy that is roughly perpendicular to this flight path. There is no evidence that the existing line presents a significant obstacle to birds in this area. Alternative, more direct, and perhaps more frequently used, flightlines may originate from putative staging areas around Lough Erne, or directly from arrival points on the north coast (Lough Swilly and Lough Foyle). These routes would avoid the Tyrone – Cavan Interconnector route altogether.

The most effective means of mitigation is through avoidance of impacts. None of the sites that support whooper swans regularly are in the immediate vicinity of the Tyrone – Cavan Interconnector, and the development also avoids wintering grounds that are used by the species following their Autumn/early Winter departure from the designated sites. The proposed overhead line will be located to the west of both foraging and roost sites in the Blackwater River valley in Northern Ireland, and there will be no potential for regular flights to take place across the line of the interconnector. The interconnector will also avoid impacts on birds wintering around Keady, where birds use the local lakes for both feeding and roosting.

There is potential that whooper swans undertaking longer distance flights, for example from staging sites at Loughs Foyle, Swilly and Neagh, may cross the line of the Tyrone – Cavan Interconnector as they move onward into winter quarters to the south, for example in the vicinity of Lough Oughter. The relative locations of these sites with respect to that of the Tyrone – Cavan Interconnector suggest that the most likely part of the overhead line to be crossed at this time is towards its northern end. Birds generally fly at higher altitudes on these migratory movements than during diurnal movements, but many fly within the altitude band occupied by the proposed overhead line (Pennycuick *et al* 1996, Griffin *et al* 2011). Between Towers 32 and 33 the line passes over the Blackwater River, and bird diverters will be fitted to the earth line (highest line) between Tower 30 and Tower 43 As a further safeguard, diverters are also to be erected on Towers 1 to 13. This area is assessed to be the most likely to attract birds to either use the river as a leading line, or to descend to ephemeral floods.

It should be noted that a high voltage 275kV overhead line, at a similar height to the Tyrone – Cavan Interconnector, is present immediately to the north and east of the proposed substation at Turleenan. This line is roughly perpendicular to any putative routes between Lough Neagh and wintering grounds to the south, and would therefore present a larger collision “target” for birds undertaking these movements.

7.7 Mobile interest feature species that also use areas outside the boundaries of European sites

Actions undertaken outside site boundaries may have the capacity to affect the integrity of the site feature, for example by reducing population levels as a result of increased mortality, disturbance of or exclusion from foraging areas. The Habitats Regulations provisions to prevent adverse impacts on site integrity would apply in this case to actions that have the potential to reduce the local distribution of European protected species. It is therefore recognised that maintenance of protected sites may require mitigation measures to be undertaken outside the boundaries of the sites.

Migrant bird species, particularly whooper swan, that are designation features of European sites arrive in Northern Ireland, generally on the north coast, from more northerly breeding areas. Many of these birds then move on through the country to traditional wintering sites in Northern Ireland and the RoI. Other birds move on to Britain. The majority of the birds that winter in Ireland use the Lough Swilly, Lough Foyle and Lough Neagh/Beg SPAs at some point in the winter, and many move between these and other sites. They are thus part of the populations for which these sites are designated, and any impacts on the species from new infrastructure as they migrate to, from and through the island of Ireland must be considered as relevant constraints on development. The general scheme of movements through the island of Ireland is known, and it is considered that the Tyrone – Cavan Interconnector (with incorporated mitigation) will not have an significant impact on the population of designation species, and will therefore not have an adverse effect on the integrity of the European sites under consideration.

7.8 Lough Neagh and Lough Beg SPA and Ramsar sites

7.8.1 Whooper swan

Lough Neagh is the nearest (4km to Ramsar site and 8km to SPA) significant major wintering ground/staging area that may be the immediate source of whooper swans that may cross the line of the Tyrone – Cavan Interconnector, and therefore may be at risk of collision with the overhead line. The area of the Ramsar and SPA sites are roughly similar but there are differences to the designated areas, hence the difference distances quoted above. Of the wintering sites in the vicinity of the Tyrone – Cavan Interconnector, it is known that birds using ephemeral floods at Derryscollop may be considered part of the greater Lough Neagh wintering population (Robinson et al, 2004). Birds that winter at Derryscollop and at the Keady Lakes are likely to fly parallel with the Tyrone – Cavan Interconnector, with a consequent low collision risk for birds undertaking this movement.

Birds that stage at Lough Neagh and then may move on to winter in the Blackwater River valley may also fly parallel to the proposed overhead line, but there is also a potential for birds to overfly the northern part of the interconnector route during onward or return movements from or to Lough Neagh. However, there is no indication that an existing overhead line immediately to the north of Turleenan either acts as a barrier to movement or is a significant collision risk to birds undertaking this movement. There is some indication that the site is also used as a staging area in spring, for birds returning to Iceland, with similar implications for swans passing in the vicinity of the proposed overhead line.

Whooper swans that use the Blackwater River valley and the Keady lakes as winter quarters are generally site-faithful through particular winters, although some birds wander over considerable distances, and some change wintering areas between winters. However, these wintering populations may be regarded as discrete sub-populations (Robinson et al 2004), and there is little risk of them coming into contact with the Tyrone – Cavan Interconnector. The numbers using the Blackwater catchment in the RoI are generally restricted to 20-40 birds (Crowe 2005), and birds using the Keady lakes of are generally present in very small numbers. However, sightings of marked birds confirm that birds that use the Keady lakes may spend part of each winter in the Lough Foyle and Lough Swilly SPAs, and are therefore part of the designation feature for those sites. They may also use sites in the RoI during the same winter (see Consolidated ES).

Birds that winter to the south of the border (RoI) after staging at Lough Neagh also have the potential to fly across the Tyrone – Cavan Interconnector towards its northern end. Again, there is no indication that the present overhead line at Turleenan is a significant collision risk for these birds.

Overhead line collision is the most frequently reported cause of death of swans in the United Kingdom (Brazil, 2003). Mortality from this cause may be concentrated where birds roost and forage in habitats that are close to overhead lines, but birds

undertaking longer movements also collide with overhead lines elsewhere. The potential for swans to cross the line of the Tyrone – Cavan Interconnector towards the north of the line has been addressed by including diverters in the design of the overhead line, between Towers 1 and 13 and between Towers 30 and 43. A review of the effectiveness of line marking as a means of reducing bird impacts and mortality from overhead line collisions, indicated that line marking results in significant reductions in bird collisions (MacKenzie Bradshaw 2006, Frost, 2008). Spiral diverters on conductors have been shown to reduce annual losses of mute swans at Abberton Reservoir SPA to near zero (Frost, 2008). The already likely low potential for mortality arising from collision with the proposed overhead line is therefore likely to be lowered further by the use of line markers on the earth wire.

A review of the effectiveness of line marking as a means of reducing bird mortality from overhead line collisions indicated that line marking results in significant reductions in bird collisions (MacKenzie Bradshaw 2006). Whilst it is possible that at some time there will be collisions of whooper swans with the proposed overhead line, it cannot be known if these will be of birds that have used this or any other European designated sites. The effect on the population of whooper swans as a whole will be negligible, and any mortality arising from the collisions will not affect the integrity of the European site or its conservation objectives.

7.8.2 Wetland habitats, pollan (Ramsar site features)

Potential impacts from construction of the Tyrone – Cavan Interconnector include discharge of pollutants (including silt) to water courses. There is a negligible potential for pollutants to reach the waters of the Ramsar site, with adverse effects on wetland habitats and fish species. Pollution prevention and control measures will be a part of the standard mitigation measures for the Tyrone – Cavan Interconnector, and have been provided in the Outline Construction Environmental Management Plan (CEMP – provided in Annex E) and will be included in the contractor's site management documentation.

NIEA along with the Environment Agency for England and Wales (EA) and the Scottish Environment Protection Agency (SEPA) publishes a series of good practice guidance Pollution Prevention Guidelines (PPG) documents. Other good practice guidance can be found in documents published by Construction Industry Research and Information Association (CIRIA). It is proposed that construction of the Tyrone – Cavan Interconnector will be in accordance with good practice set out in the documents listed below:

- DCAL (no date) Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- Loughs Agency (no date). Guidelines for Fisheries Protection during Development Works (Foyle and Carlingford Areas): Environmental Guidelines Series – No. 1;
- SEPA (2008) Engineering in the Water Environment Good Practice Guide: Construction of River Crossings;
- CIRIA Report 697 (2007) The SuDS Manual;
- CIRIA Report 648 (2006) Control of Water Pollution from Linear Construction Projects – Technical Guidance;
- CIRIA Report 650 (2010) Environmental Good Practice on site (3rd Edition);
- CIRIA Report 521 (2000) SuDS – Design Manual for Scotland and Northern Ireland; and
- NIEA (2004) Getting Your Site Right: Industrial and Commercial Pollution Prevention.

NIEA Pollution Prevention Guidelines (PPG), the most relevant being:

- PPG 1 – General Guide to the Prevention of Pollution (May 2011);
- PPG 2 – Above Ground Oil Storage Tanks (February 2004);
- PPG 3 – Use and Design of Oil Separators in Surface Water Drainage Systems (April 2006);
- PPG 4 – Treatment and Disposal of Sewage Where No Foul Sewer Is Available (July 2006);

- PPG 5 – Works or Maintenance In or Near Watercourses (October 2007);
- PPG 6 –Working at Construction and Demolition Sites (April 2010);
- PPG 7 – The Safe Operation of Refuelling Facilities (July 2011);
- PPG 8 – Safe Storage and Disposal of Used Oils (February 2004);
- PPG 13 – Vehicle Washing and Cleaning (March 2007);
- PPG 18 – Managing Fire Water and Major Spillages (June 2008);
- PPG 21 – Pollution Incidence Response Planning (March 2009);
- PPG 22 – Incidence Response - Dealing with Spills(April 2011); and,
- PPG 26 - Safe Storage: Drums and Intermediate Bulk Containers (May 2011).

Appropriate consents will be required for works affecting watercourses and construction work will need to comply with any conditions imposed. Applications for appropriate permits will be made following detailed design. All consents, permits and licences will be in place prior to commencement of any works.

The mitigation measures that will be adopted to control silt-laden runoff and spillages are described below. The following will apply mainly to the Turleenan substation site, but elements will also apply to tower sites.

7.8.3 Management of Silt-laden Runoff

Within the framework of mitigation outlined in the Consolidated ES and the Outline CEMP, the Contractor will prepare and implement a Silt Management Strategy to:

- Programme and manage construction activities to prevent sediment generation;
- Protect water bodies from sediment pollution by preventing silt-laden runoff reaching watercourses; and
- Propose adequate measures to treat runoff prior to discharge (under consent from NIEA if to watercourse).

The Silt Management Plan will contain further measures to minimise and control soil erosion from the construction site.

7.8.4 Managing Generation of Silt-laden Runoff

The first step towards preventing silt pollution from construction works is to minimise the generation of silt-laden runoff. This can be achieved by carefully planning the site works so that activities likely to generate silt-laden runoff are carried out during drier months, and erosion of surface soils is controlled.

Seasonal weather patterns should be taken into consideration when programming and planning construction activities. Existing vegetation should be retained where possible as mature vegetation holds the soil and prevents soil erosion. Areas where vegetation clearance is required should be kept to a minimum, and the works divided into phases, with seeding and planting of the phases that are complete. This will minimise the areas of exposed soil and thus the risk of erosion.

Site compounds and stockpiles will be kept to a minimum and will be located well away from any watercourses (>50 m). To minimise the loss of sediment from stockpiles they will be located away from drains and watercourses, to minimise the amount of silt-laden runoff available as a result of rainfall events.

Vehicle crossings of watercourses will be minimised and will use designated crossing points only. Site water will be pumped or directed to settling lagoons or other treatment prior to consented discharge to watercourses or groundwater via field spreading (See Section "Measures to Treat Runoff").

7.8.5 Prevention of Silt-laden Runoff Entering Watercourses

Despite efforts to minimise the amount of silt-laden runoff generated on site (including dewaters), under wet conditions some will inevitably form and will need to be managed to prevent it reaching watercourses untreated. Site water will be intercepted by a temporary drainage system using filter and cut off drains and pumped or directed to settling lagoons or other treatment prior to consented discharge to watercourses or groundwater via field spreading (See Section "Measures to Treat Runoff"). The Contractor will ensure that there is adequate space available for the interception and treatment of silt-laden water. In addition, those areas where the risk to a watercourse is greater (i.e. where the proposed scheme crosses the watercourse or where works are adjacent to a watercourse) will require special measures to manage the risk from silt pollution.

The drainage system will be developed to prevent silt-laden runoff from entering watercourses and minor drainage ditches (leading to these watercourses) without treatment. A multi-barrier approach (e.g. 10m vegetation buffer strips along watercourses, earth bunds, silt fences, straw bales wrapped in geo-textile, or proprietary treatment) will be implemented on a site specific basis and subject to full regulatory controls imposed by NIEA. Additionally, cut off channels will be used where appropriate to minimise over land flow. Further, existing purpose built surface water drains will be blocked or protected to prevent the ingress of silt-laden runoff and to ensure that the watercourses are not polluted indirectly. Works in watercourses are considered separately below.

7.8.6 Measures to Treat Runoff

Although the generation of silt-laden runoff can be minimised, some silt-laden runoff will form during wet weather, dewatering excavations, works in and adjacent to watercourses, and to a lesser extent from the use of water during construction. As a result, it will be necessary for the contractor to develop and implement a drainage system based on construction SuDS and other methods (e.g. pumps and silt filtering equipment) to intercept and treat silt-laden runoff. The framework of such measures are provided for the in the Consolidated ES and Outline CEMP. Other pollutants, such as hydrocarbons, may also be present in runoff and require treatment (see "Water Quality Monitoring" below). These measures will be regularly maintained to ensure they are operating correctly and efficiently. No discharges of untreated silt-laden water to watercourses will be allowed and only treated water can be discharged to a watercourse (or other controlled water) under consent from NIEA (which will impose standards on the quality of allowed discharges).

There will be daily inspections by the Environmental Manager to ensure compliance with the agreed mitigation measures. There will also be weekly inspections by the Employer's Agent (e.g. Environmental/Ecological Clerk of Works). Records will be kept of findings and any remedial measures required to maintain best practice across the site with respect to protection of the water environment.

Storage of runoff from the substation site from possible locally severe storm conditions should be provided. Construction SuDS can be used during construction depending on site conditions, including soakaways, infiltration basins, settlement ponds, etc. Timing of the construction works will not only help to minimise silt generation, but can also greatly influence the success of the treatment. Depending on the treatment methods to be used, and particularly those involving vegetation, it is important to allow sufficient time for them to be established (e.g. swales, reed beds, etc). Discharges will only be carried out if consent from NIEA is in place. As the Tyrone – Cavan Interconnector already incorporates a SuDS pond as part of the substation drainage system for its operational phase and it will be utilised as construction SuDS. Any silt will be removed prior to its use in the operational phase. Finally, as provide for in the Outline CEMP, an Emergency Response Plan will be put in place during the construction phase. This will allow adequate procedures to be followed in the event of an emergency (e.g. unexpected heavy rainfall).

7.8.7 Work in, near or potentially liable to affect Watercourses

Potential for adverse impacts are greater where works are in and adjacent to watercourses. Such work must be minimised where possible, but where it is essential it will be carried out in accordance with the (EA, SEPA, NIEA) PPG 5 and Consents from the NIEA and Rivers Agency. In particular:

- All works will be carried out under a Method Statement approved by the Rivers Agency and NIEA;
- Affected area to be kept to a minimum and agreed with the Employers Agent;
- Works to be carried out during dry weather;
- Other than where there are works direct to a watercourse, 10m vegetated buffer strips will be maintained.
- Temporary crossings of watercourses will be avoided where possible. However, if required these will be subject to the same design controls as permanent structures, as described in the guidance documents listed above;
- A boom is to be set out across the channel downstream to collect oil/surface material;
- Pre-fabricated structures to be used wherever possible to minimise the use of wet concrete near water. Pouring of concrete will take place in dry conditions only;
- No refuelling of plant or machinery is to take place near watercourses (designated sites within construction compound to be used only); and
- All plant to be clean and self-bunded.

7.8.8 Storage and Spillage Emergency Response

The storage and use of potentially polluting chemical substances, including fuel and other oils will be in accordance with good practice guidance listed earlier and will include as a minimum the following measures:

- Fuel and other potentially polluting chemicals will be stored in the Construction Compound well away from any watercourses in a secure impermeable and bunded storage area (minimum capacity 110%);
- Refuelling of plant and maintenance of vehicles and equipment will take place in a designated area at the site compound only (> 50 m away from any watercourse);
- Fixed plant and all storage tanks will be self bunded;
- Mobile plant will be in good working order, kept clean and fitted with drip trays where appropriate;
- A Pollution Prevention Plan will be prepared and construction workers trained to respond to spillages. This will describe measures to prevent pollution and the procedures in the event of an environmental emergency occurring, such as a spillage. Additionally a Pollution Incident Response Plan should be put in place as part of the EMS. Staff will be trained as part of the Site Induction and Tool Box Talks and made aware of the NIEA's emergency hotline – 0800 80 70 60);
- Spillage kits and oil absorbent material will be carried by mobile plant and located at vulnerable locations (e.g. crossings of land drains and ditches);
- Designated concrete wash out areas (with containment for tinkering away) will not be constructed near watercourses (> 50 m away) in accordance with good practice guidance and will be clearly identified and used;
- Boot/wheel wash facilities will be available with water collected and treated prior to consented discharge;

- Stockpiles of fill material will be kept to a minimum size, well away from any watercourse, bunded or seeded with grass as required (>50 m away);
- Runoff from machine wash / service areas, construction waste / debris will be prevented from entering any water body; and
- The site will be secured to prevent vandalism.

7.8.9 Post-construction monitoring

Following construction, drainage from the Turleenan substation site will be directed into a substantial SuDS pond (~85m long and 14.5m wide). Following separation of suspended sediment, water will be discharged into the adjacent minor stream. The stream waters will be subjected to regular monitoring to ensure that there is no likelihood of additional sediments reaching the European Sites.

Summary

- Lough Neagh and Lough Beg SPA - Potential collision of very low numbers of migrating, dispersing or commuting whooper swans with the proposed overhead line during operation. Any such impacts through collision are considered to be de minimis in terms of the overall SPA population and will not adversely affect the integrity of the site. The inclusion of bird flight diverters at the northern end of the Tyrone – Cavan Interconnector will further reduce any potential collisions.
- Lough Neagh and Lough Beg Ramsar site – With standard mitigation as prescribed in the Consolidated ES, potential contamination of wetland habitats and indirect impacts to the pollan population via discharges into the Blackwater River during construction and operation will not occur. There is no potential for adverse effects to arise and thus no impacts to site integrity will occur.

7.9 Lough Foyle and Lough Swilly SPAs

The Lough Foyle and Lough Swilly SPAs are located remotely to the north of the Tyrone – Cavan Interconnector. However, a large proportion of the whooper swan wintering population makes its initial autumn landfall at these two sites, and so large scale mortality of the species elsewhere in Ireland has the potential to affect the designation feature of these European Sites. Many of the birds using the sites will move on to the Lough Erne complex, or will otherwise pass well to the west of the location of the proposed Tyrone – Cavan Interconnector as they disperse to sites further south in RoI. However, some birds will move on to Lough Neagh and may then continue to sites that may require crossing the line of the Tyrone – Cavan Interconnector, with a consequent risk of collision. The assessment and mitigation that are applied to the Lough Neagh and Lough Beg SPA above are therefore applicable to this part of the Lough Foyle/Swilly designation feature.

Summary

- Lough Foyle SPA and Lough Swilly SPA - Potential collision of very low numbers of migrating, dispersing or commuting whooper swans with the proposed overhead line during operation. The potential impacts through collision are considered to be de minimis and will not adversely affect the overall SPA population of these species or the integrity of the site. The inclusion of diverters at the northern end of the Tyrone – Cavan Interconnector will further reduce any potential collisions.

7.10 Lough Oughter Complex SPA

The Lough Oughter Complex SPA is likely to be the destination of a part of the population that arrives in Ireland on the north coast, and may therefore include birds that have used Lough Foyle as a staging post. The most direct route between north coast arrival areas and Lough Oughter lies to the west of the Tyrone – Cavan Interconnector, but given the species propensity to wander, it is likely that some birds that use this SPA will at some time cross the line of the Tyrone – Cavan Interconnector. The comments and mitigation that are applied to the Lough Neagh and Lough Beg SPA above are therefore applicable to this part of the Lough Oughter designation feature.

Summary

- Potential collision of very low l numbers of migrating, dispersing or commuting whooper swans with the proposed overhead line during operation. The potential impacts through collision are considered to be de minimis and will not adversely affect the SPA population of this site or the integrity of the site. The inclusion of diverters at the northern end of the Tyrone – Cavan Interconnector will further reduce any potential collisions.

Table 14 summarises the assessment on Site Integrity for the selected species. For clarity other designation features are included.

Table 14: Summary of assessment on site integrity

Summary of assessment on site integrity				
Site	**Distance**	**Designation feature**	**Potential for Impact**	**Effect**
Lough Neagh and Lough Beg SPA/Ramsar		Breeding common tern;	Negligible (*de minimis*) – Birds likely to be restricted to vicinity of the SPA during the breeding season.	No adverse effect
		Breeding bird assemblage	Negligible – Birds likely to be restricted to vicinity of the SPA during the breeding season.	No adverse effect
		Wintering Bewick's swan, whooper swan (Annex I species)	Potential collision impacts on small numbers of migrating, dispersing or commuting birds (whooper swan) – negligible in the context of Designated Site populations Negligible (Bewick's swan) - now a rare species in Northern Ireland, and rarely recorded in the vicinity of the Tyrone – Cavan Interconnector. Limited numbers of birds available for collision.	No adverse effect
		Wintering waterfowl assemblage	Negligible – Birds likely to be restricted to vicinity of the SPA during winter. Migration direction dominantly to/from east and north, with birds unlikely to pass through vicinity of overhead line. Wintering whooper swans as part of this assemblage are dealt with separately.	No adverse effect

Summary of assessment on site integrity				
Site	**Distance**	**Designation feature**	**Potential for Impact**	**Effect**
		Regularly supports >20,000 waterfowl.	Negligible – Birds likely to be restricted to vicinity of the SPA during winter Migration direction dominantly to/from east and north, with birds unlikely to pass through vicinity of overhead line. Wintering whooper swans as part of this assemblage are dealt with separately.	No adverse effect
Lough Neagh and Lough Beg Ramsar		Natural or near-natural wetlands, common to more than one biogeographic region.	Impacts on habitats within Ramsar site from pollutants discharged into Blackwater River. Distance from Tyrone – Cavan Interconnector sufficient to mitigate surface water impacts.	No adverse effect
		Supports a population of pollan	Potential impacts on fish within Ramsar site from pollutants discharged into Blackwater River. Distance from Tyrone – Cavan Interconnector and best practice sufficient to mitigate surface water impacts.	No adverse effect
Lough Oughter Complex SPA (RoI)		Wintering whooper swan (Annex I species), wigeon.	Potential collision impacts on small numbers of migrating or dispersing birds (whooper swan). Whilst it is assessed that collisions of individual whooper swans may occur, it will not have an adverse effect on the integrity of the site. The following mitigation will prevent occasional collisions: Provision of diverters between Towers 1 and 13 and Towers 30 and 43. These are the highest risk areas close to potential commuting routes or feeding areas. Mitigation will improve visibility of overhead lines by whooper swan. Negligible – For wigeon, the site is distant and birds are unlikely to cross the proposed overhead line.	No adverse effect
		Breeding great crested grebe	None – Birds likely to be restricted to vicinity of the SPA during the breeding season	No adverse effect

Summary of assessment on site integrity				
Site	**Distance**	**Designation feature**	**Potential for Impact**	**Effect**
		Wetland and waterbirds	None - The site is distant and in a different water catchment to the Tyrone – Cavan Interconnector and is therefore hydrologically isolated from the Tyrone – Cavan Interconnector	No adverse effect
Lough Foyle SPA		Wintering, whooper swan, bar-tailed godwit (Annex I species), light-bellied brent goose. Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	Potential collision impacts on small numbers of migrating or dispersing birds (whooper swan). Whilst it is assessed that collisions of individual whooper swans may occur, it will not have an adverse effect on the integrity of the site. The following mitigation will prevent occasional collisions: Provision of diverters between Towers 1 and 13 and Towers 30 and 43. These are the highest risk areas close to potential commuting routes or feeding areas. Mitigation will improve visibility of overhead lines by whooper swan. Negligible - For remaining feature species, the site is distant and migration vectors are unlikely to cross the proposed overhead line.	No adverse effect
Lough Foyle Ramsar		A particularly good representative example of a wetland; a particularly good representative example of a wetland, which plays a substantial hydrological, biological and ecological system role in the natural functioning of a major river basin which is located in a trans-border position.	None - The site is distant and in a different catchment to the Tyrone – Cavan Interconnector and is hydrologically isolated from the Tyrone – Cavan Interconnector.	No adverse effect

Summary of assessment on site integrity				
Site	**Distance**	**Designation feature**	**Potential for Impact**	**Effect**
Lough Swilly SPA (RoI)		Wintering, whooper swan, Greenland white-fronted goose (Annex I species), greylag goose. Wintering waterfowl assemblage Regularly supports >20,000 waterfowl.	Potential collision impacts on small numbers of migrating or dispersing birds (whooper swan). Whilst it is assessed that collisions of individual whooper swans may occur, it will not have an adverse effect on the integrity of the site. The following mitigation will prevent collisions: Provision of diverters between Towers 1 and 13 and Towers 30 and 43. These are the highest risk areas close to potential commuting routes or feeding areas. Mitigation will improve visibility of overhead lines by whooper swan. Negligible - For remaining feature species, the site is distant and migration vectors are unlikely to cross the proposed overhead line.	No adverse effect

7.11 In Combination Effects

It is a requirement of the HRA process that 'in-combination' effects with other plans and programmes are considered, as other plans and programmes may also contribute to potential impacts on the integrity of designated sites.

It has been shown in the Screening determination and in the assessment of potential effects on site integrity that no significant effects are likely to arise during the construction or operation of the Tyrone – Cavan Interconnector. Individual birds may be at risk of collision, but this is potential impact is considered *de minimis* in terms of the overall SPA populations examined., For transparency and should the Competent Authority wish to examine other plans and projects further in their assessment, a list of other projects and plans in the vicinity of the Tyrone Cavan Interconnector has been provided as Annex E.

For the purposes of the Tyrone – Cavan Interconnector, the categories of other developments included have been taken to include all known overhead line developments within 30 km of the Tyrone – Cavan Interconnector. No other planning developments with the potential for significant in-combination effects upon whooper swan populations that are designation features of European sites were identified. Additionally, no plans with the potential for significant in-combination effects with the Tyrone - Cavan Interconnector were identified.

The following proposed overhead lines have been considered in terms of in-combination effects:

- Tamnamore to Omagh 110kV network reinforcement project (planning permission approved). This is a 50km 110kV overhead electricity line and substation between existing NIE substations at Tamnamore (Dungannon) and Omagh. Tamnamore substation is located approximately 4.7km to the north west of the proposed interconnector at its closest point. The Tamnamore to Omagh line is located approximately 1.6km from the proposed interconnector at its closest point; and,
- North-South 400kV Interconnection Development (i.e. the section of the proposed interconnector in the Republic of Ireland) running from the Northern Ireland/Republic of Ireland border at a position between the townlands of Doohat

or Crossreagh, County Armagh, and Lemgare, County Monaghan running south (via the Northern Ireland townland of Crossbane) to an existing substation at Woodland, County Meath.

Tamnamore to Omagh Line

The conductor will be at a low level, carried on wooden poles that range from 12m to 22m in height, with the majority less than 15m in height, and is unlikely to have a measureable impact on the whooper swan populations of European sites (RPS 2011). Bird species may in some circumstances suffer mortality from electrocution at overhead line towers and lines. However, this cause of death is most frequent at medium voltages, where power poles (1 kV to 60 kV) are constructed with close spacing between the pole, its cross arm and its wires or other energized parts such that birds can be electrocuted by completing an electric circuit (BirdLife International 2007). Electrocution of swan species is unlikely and thus in-combination effects arising from electrocution are not an issue with regard to passing swans.

North-South 400kV Interconnector Development

The continuation of the 400kV single circuit OHL from the area where the Tyrone – Cavan Interconnector crosses the jurisdictional border between the townlands of Doohat or Crossreagh, County Armagh, and Lemgare, County Monaghan to the existing 400kV substation at Woodland, Co. Meath, extending across lands in Counties Monaghan, Cavan and Meath (i.e. the EirGrid section of the overall proposed Interconnector), which has been subject to its own Habitats Regulations Assessment (Natura Impact Assessment).

Any potential impacts (without mitigation) on European site features arising from the SONI proposal in combination with the North South Interconnector would be restricted to the following sites:

- Lough Neagh and Lough Beg SPA - Potential collision of small numbers of migrating, dispersing or commuting Whooper Swans with the proposed overhead line during operation;
- Lough Neagh and Lough Beg Ramsar site – Potential contamination of wetland habitats and pollan population via discharges into the Blackwater River during construction and operation;
- Lough Oughter Complex SPA - Potential collision of small numbers of migrating or dispersing Whooper Swans with the proposed overhead line during operation, principally when birds are relocating from the Lough Neagh staging area;
- Lough Foyle SPA - Potential collision of small numbers of migrating or dispersing Whooper Swans with the proposed overhead line during operation; and
- Lough Swilly SPA - Potential collision of small numbers of migrating or dispersing Whooper Swans with the proposed overhead line during operation.

Potential cumulative and in-combination effects that may arise from the North-South 400kV Interconnection Development and its extension into Northern Ireland would be largely restricted to a potential to increase collision mortality of whooper swan (a designated feature of assessed sites). However, migratory movements for both the North-South 400kV Interconnection Development and the Tyrone - Cavan Interconnector have been identified as occurring primarily parallel to the overall proposed interconnector development, with only limited potential for crossing the North-South 400kV Interconnection Development on route to and from Lough Neagh and beyond. Any potential impacts to SPA populations from the proposed development in Northern Ireland have been assessed as *de-minimis* and therefore could not be considered to contribute to any significant cumulative effect with the North-South Interconnector. No regular flightlines were identified the study. Occasional flights were noted during

surveys and the corresponding section of the overhead line will be fitted with diverters as mitigation. Therefore no significant cumulative effects on the Whooper Swan populations are anticipated.

Areas and lengths of alignment for the North-South 400kV Interconnection Development proposed for marking with flight diverters are described as follows:

- Between Towers 139 and 147 where the alignment passes to the east of Ballintra it is recommended that approximately 2.8km of the earth wires are marked with swan flight diverters;
- Between Towers 160 and 169 where the alignment passes to the west of Lough Egish it is recommended that approximately 3.0km of the earth wires are marked with swan flight diverters;
- Between Towers 196 and 203 in the vicinity of Comertagh and Raferagh Loughs, it is recommended that approximately 2.5km of the earth wires are marked with swan flight diverters;
- Between Towers 257 to 268 near Cruicetown / Whitewood Lough; it is recommended that approximately 3.3km of the earth wires are marked with swan flight diverters;
- Between Towers 279 and 283 west of Clooney Lough; it is recommended that approximately 1.5km of the earth wires are marked with swan flight diverters;
- West of the Yellow River foraging area between Towers 291 and 295. The main identified flightline does not cross the alignment. However there is potential that Whooper Swan could move towards the area of the alignment. Given that high numbers occur in this area it is recommended that approximately 1.5km of the earth wires are marked with swan flight diverters;
- Between Towers 307 and 312 at the River Blackwater crossing point it is recommended that approximately 1.6km of the earth wires are marked with swan flight diverters; and
- In addition, between Towers 355 and 357 (including the River Boyne Crossing), 60cm diameter marker spheres will be added to the earth wire to increase visibility.

A Habitats Directive assessment of the proposed interconnector has been separately undertaken for the Competent Authority in the Republic of Ireland (North-South 400 kV Interconnection Development Natura Impact Statement 2015). That assessment has also assessed the in-combination effects of the proposed interconnector in Northern Ireland and the Republic of Ireland. It has concluded that:

"…given the very low numbers of migratory flights, any mortality arising from any such collisions, the proposed development will not adversely affect the integrity of any of the relevant European Sites in view of their conservation objectives in respect of the Whooper Swan or any conservation objectives in respect of those European Sites".

The assessment concludes that there will be no adverse effects to the integrity of European Sites under consideration, or to mobile species associated with those sites arising from the North-South 400kV Interconnection Development, alone or in-combination with other plans or projects. .

8 Conclusions

This Information to Inform Habitats Regulations Assessment has been submitted for the Tyrone - Cavan Interconnector to enable the Competent Authority to conduct a Habitats Regulations Assessment in relation to the European Sites identified in this report.

As established by recent case law, in order for such an HRA, to be lawfully conducted, the Competent Authority:

> (i) must identify, in the light of the best scientific knowledge in the field, all aspects of the Tyrone - Cavan Interconnector which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;
>
> (ii) must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and
>
> (iii) may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the Competent Authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects.

This Information to Inform Habitats Regulations Assessment assesses the likely significance of all potential impacts arising from the Tyrone - Cavan Interconnector on the integrity of the relevant European sites. It has been prepared taking into account the precautionary principle and is based on the best scientific knowledge in the field.

The Stage 1 Screening Assessment found that the proposed development will not result in any Likely Significant Effects on European Sites in view of their conservation objectives. Special reference was paid to sites that are hydrologically connected to the area of the Tyrone - Cavan Interconnector and for which whooper swan was a designation feature.

The Stage 1 Screening determined that while Individual birds may be at risk of collision, the potential impact is considered *de minimis* in terms of the overall SPA populations examined. The proposed development will not result in a likely significant effect to the Conservation Objective of maintaining the favourable conservation condition of Whooper Swan as it relates to the SPA sites examined, or to the overall coherence of the Natura 2000 Network.

Whilst there is ever confidence in the finding of no Likely Significant Effects on any European Sites, additional information to inform an Appropriate Assessment has been provided should the Competent Authority deem that such an assessment is necessary. This exercise found that the Tyrone – Cavan Interconnector would have no adverse effects on the integrity of the following European Sites in view of their conservation objectives; , Lough Neagh and Lough Beg SPA and Ramsar, Lough Oughter Complex SPA, Lough Swilly SPA and Lough Foyle SPA.

It is apparent that the choice of line route for the Tyrone – Cavan Interconnector, generally remote from designated conservation sites, means that the potential for direct impacts on European site designation features is largely avoided. The most frequent regular movements of local populations of whooper swans in the vicinity of the Tyrone – Cavan Interconnector do not intersect the proposed route in large enough numbers to have a significant effect on any European Sites. The literature indicates that incidental mortality from overhead line collisions is generally not a biologically significant concern at a population level (e.g. Janss and Ferrer 1999, Hunting 2002).

Given the very low numbers of migratory flights of “SPA birds” expected to cross the alignment, any effects arising from collisions on the population of whooper swan associated with any of these European Sites are considered *de minimis* and not likely to be significant, in view of the conservation objectives for Whooper Swan.

Accordingly, for the reasons set out in detail in this report, in the light of the best scientific knowledge in the field, all aspects of the proposed development which, by itself, or in combination with other plans or projects, which may affect the relevant European Sites have been considered. This report contains information which the Competent Authority, may consider in making its own complete, precise and definitive findings and conclusions. It is concluded that all European sites detailed in this report have been correctly screened out or excluded from further consideration on the basis of objective information that the Tyrone - Cavan Interconnector, individually or in-combination with other plans or projects, will have no, or no appreciable, effects on those sites in view of their conservation objectives.

Further to that conclusion, additional information has been provided in the report to allow the Competent Authority, to undertake an Appropriate Assessment, should it wish to do so. It is concluded that the Competent Authority is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Tyrone - Cavan Interconnector on the integrity of the relevant Natura 2000 and Ramsar sites. In conclusion, in the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the Competent Authority is enabled to ascertain that the Tyrone - Cavan Interconnector will not adversely affect the integrity of any of the European sites concerned.

9 References

- Anon (1979) Council Directive of 2 April 1979 on the conservation of wild birds (79/409/EEC) (EC Birds Directive)
- Anon (1992) Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Office for Official Publications of the European Communities.
- APLIC (Avian Power Line Interaction Committee). 1994: Mitigating bird collisions with power lines: the state of the art in 1994. Edison Electric Institute. Washington, DC, USA.
- Baillie, S.R., Marchant, J.H., Leech, D.I., Renwick, A.R., Eglington, S.M., Joys, A.C., Noble, D.G., Barimore, C., Conway, G.J., Downie, I.S., Risely, K. & Robinson, R.A. 2012. BirdTrends 2011. BTO Research Report No. 609. BTO, Thetford
- Benítez-López, A., Ikemade, R. and Verweij, P.A. 2010. The impacts of roads and other infrastructure on mammal and bird populations: A meta-analysis. *Biological Conservation*, 143, 6, 2010, Pp 1307–1316
- BirdLife International 2007: Position Statement on Birds and Power Lines On the risks to birds from electricity transmission facilities and how to minimise any such adverse effects *adopted by the BirdLife Birds and Habitats Directive Task Force on 10 May 2007.*
- Brazil, M. 2003. The Whooper Swan. London: T & AD Poyser
- Brown, M.J., Linton, E. & Rees, E.C. 1992. Causes of mortality among wild swans in Britain. *Wildfowl* 43: 70–79.
- Crowe, O., McElwaine, J. G., Worden, J., Watson, G. A., Walsh, A., and Boland, H. 2005: Whooper *Cygnus cygnus* and Bewick's *C. columbianus bewickii* Swans in Ireland: results of the International Swan Census, January 2005. Irish Birds 7: 483-488
- Crowe, O, Austin, G.E., Colhoun, K.. Cranswick, P.A., Kershaw, M. and Musgrove, A.J. 2008. Estimates and trends of waterbird numbers wintering in Ireland, 1994/95 to 2003/04. *Bird Study* (2008) 55, 66–77
- Department of the Environment Northern Ireland, 2013. Planning Policy Statement 2 Natural Heritage (PPS 2).
- DoEHLG, 2009. Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities. Available from http://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf. [Accessed 07/05/2015].
- EC 2000. Managing Natura 2000 sites : The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Commission, Luxembourg: Office for Official Publications of the European Communities
- EC 2002: Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission, Luxembourg
- EC 2010: Guidance Document. Wind energy developments and Natura 2000. EU Guidance on wind energy development in accordance with the EU nature legislation. European Commission, Brussels
- EHS 2008: Our environment, our heritage, our future. State of the Environment Report for Northern Ireland. Environment and Heritage Service, Belfast
- EirGrid (February 2012). Ecology Guidelines for Electricity Transmission Project – A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects. Available: http://www.eirgrid.com.
- FAA 2007: Obstruction marking and lighting. Advisory Circular AC 70/7460-1K, Federal Aviation Administration).U.S. Dept. Transportation. 55 pp.
- Frost D. (2008) The use of 'flight diverters' reduces mute swan Cygnus olor collision with power lines at Abberton Reservoir, Essex, England. Conservation Evidence, 5, 83-91
- Griffin, L., Rees, E. & Hughes, B. 2011. Migration routes of Whooper Swans and geese in relation to wind farm footprints: Final report. WWT, Slimbridge. 87 pp..
- Hart District Council v. Secretary of State for Communities and Local Government, Luckmore Limited and Barratt Homes Limited, [2008] EWHC 1204, http://www.epr.uk.com/eprnews/Dilly_Lane_files/Dilly%20Lane%20Judgement.pdf.
- Hunting, K. 2002: A roadmap for PIER research on avian collisions with power lines in California. Commission Staff Report P500-02071F submitted to the California Energy Commission, Sacramento, California, USA
- IEEM 2006: Guidelines for Ecological Impact Assessment in the United Kingdom. Institute of Ecology and Environmental Management, Winchester.
- Janss, G.F.E., and Ferrer, M. 1998: Rate of bird collision with power lines: effects of conductor-marking and static wire-marking. Journal of Field Ornithology 69(1):8-17.

Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC.

- Jordan, C. and Smith, R.V.: Methods to predict the agricultural contribution to catchment nitrate loads: designation of nitrate vulnerable zones in Northern Ireland. *Journal of Hydrology* 304 316–329
- MacKenzie Bradshaw MBEC, 2006. Beauly Denny EIS – Tech Annex 22.22 – Review of Bird Collisions and Powerlines.
- Martin, G.R. and Shaw, J.M. 2010. Bird collisions with power lines: Failing to see the way ahead? *Biological Conservation* 143, 11, 2695–2702
- McElwaine, J.G., Wells, J.H. & Bowler, J.M. 1995. Winter movements of Whooper Swans visiting Ireland: preliminary results. Irish Birds 5: 265–278.
- NIEA 2008. The condition of Northern Ireland's Areas of Special Scientific Interest: the Results of the First Condition Assessment Monitoring Cycle 2002-2008. A report by the Northern Ireland Environment Agency (2008), Research and Development Series No. 08/10
- NIEA 2010. A Strategy for Surveillance and Monitoring of European Protected Habitats and Species in Northern Ireland Implementing Regulations 3 and 6 of the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2009 for the protection of habitats and species of Community interest in Northern Ireland
- NPWS 2008. The Status of EU Protected Habitats and Species in Ireland. Conservation Status in Ireland of Habitats and Species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC. National Parks and Wildlife Service, Department Of The Environment, Heritage and Local Government, Dublin.
- Pennycuick, C.J., Einarsson, O., Bradbury, T. A. M. and Owen, 1996: Migrating whooper swans *Cygnus cygnus:* satellite tracks and flight performance calculations. *Journal of Avian Biology* Vol. 27, No. 2 (Jun., 1996), pp. 118-134
- Ramsar 2002: Implementation of the Ramsar Convention on Wetlands of International Importance National Report submitted to the 8th Meeting of the Conference of the Parties, Valencia, Spain, 2002
- Robinson, JA, K Colhoun, JG McElwaine & EC Rees. 2004. Whooper Swan *Cygnus cygnus* (Iceland population) in Britain and Ireland 1960/61 – 1999/2000. Waterbird Review Series, The Wildfowl & Wetlands Trust/Joint Nature Conservation Committee, Slimbridge
- RPS 2011. Tamnamore to Omagh 110kV Reinforcement Project. Section 10.0. Ecology. Environmental Statement Volume 1. Northern Ireland Electricity, Belfast.
- Therivel, R. (2009) 'Appropriate assessment of plans in England', Environmental Impact Assessment Review 29(4), pp. 261-272.
- SNH/David Tyldesley and Associates (2013) Habitats Regulations Appraisal of Plans: Guidance for Plan-Making Bodies in Scotland. Available from: http://www.snh.gov.uk/docs/A1500925.pdf [Accessed 11/05/2015].
- Stroud, DA, Chambers, D, Cook, S, Buxton, N, Fraser, B, Clement, P, Lewis, P, McLean, I, Baker, H & Whitehead, S (eds). 2001. The UK SPA network: its scope and content. JNCC, Peterborough.
- 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 Natural Heritage Commissioned Report No.459.*
- SNH 2010: Use of Avoidance Rates in the SNH Wind Farm Collision Risk Model. SNH Avoidance Rate Information & Guidance Note. Scottish Natural Heritage, Inverness.
- Wernham, C.V., Toms M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds). 2002: The Migration Atlas: movements of the birds of Britain and Ireland. T. & A.D. Poyser, London.
- Williams, J.M., ed. 2006. Common Standards Monitoring for Designated Sites: First Six Year Report. Peterborough, JNCC.

Annex A – Conservation Objectives

Lough Neagh and Lough Beg SPA Conservation Objectives

The Conservation Objectives for this site are:

To maintain each feature in favourable condition.

For each feature there are a number of component objectives which are outlined in the tables below. For each feature there are a series of attributes and measures which form the basis of Condition Assessment. The results of this will determine whether a feature is in favourable condition, or not.

Lough Neagh and Lough Beg Feature Objectives

Feature	Component Objective
Common Tern breeding population	No significant decrease in population against national trends, caused by on-site factors
Common Tern breeding population	Fledging success
Great Crested Grebe breeding population	No significant decrease in population against national trends, caused by on-site factors
Great Crested Grebe breeding population	Fledging success
Great Crested Grebe passage population	No significant decrease in population against national trends, caused by on-site factors
Whooper Swan wintering population	No significant decrease in population against national trends, caused by on-site factors
Bewick's Swan wintering population	No significant decrease in population against national trends, caused by on-site factors
Golden Plover wintering population	No significant decrease in population against national trends, caused by on-site factors
Great Crested Grebe wintering population	No significant decrease in population against national trends, caused by on-site factors
Pochard wintering population	No significant decrease in population against national trends, caused by on-site factors
Tufted Duck wintering population	No significant decrease in population against national trends, caused by on-site factors
Scaup wintering population	No significant decrease in population against national trends, caused by on-site factors
Goldeneye wintering population	No significant decrease in population against national trends, caused by on-site factors
Little Grebe wintering population	No significant decrease in population against national trends, caused by on-site factors
Cormorant wintering population	No significant decrease in population against national trends, caused by on-site factors
Greylag Goose wintering population	No significant decrease in population against national trends, caused by on-site factors
Shelduck wintering population	No significant decrease in population against national trends, caused by on-site factors
Wigeon wintering population	No significant decrease in population against national trends, caused by on-site factors
Gadwall wintering population	No significant decrease in population against national trends, caused by on-site factors
Teal wintering population	No significant decrease in population against national trends, caused by on-site factors
Mallard wintering population	No significant decrease in population against national trends, caused by on-site factors

Feature	Component Objective
Shoveler wintering population	No significant decrease in population against national trends, caused by on-site factors
Coot wintering population	No significant decrease in population against national trends, caused by on-site factors
Lapwing wintering population	No significant decrease in population against national trends, caused by on-site factors
Waterfowl Assemblage wintering population	No significant decrease in population against national trends, caused by on-site factors
Waterfowl Assemblage wintering population	Maintain species diversity contributing to the Waterfowl Assemblage
Habitat	To maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species subject to natural processes
Habitat	Maintain the extent of main habitat components subject to natural processes
Habitat	Maintain or enhance sites utilised as roosts

Lough Foyle SPA Conservation Objectives

The Conservation Objectives for this site are:

To maintain each feature in favourable condition.

For each feature there are a number of component objectives which are outlined in the tables below. For each feature there are a series of attributes and measures which form the basis of Condition Assessment. The results of this will determine whether a feature is in favourable condition, or not.

Lough Foyle SPA Feature Objectives

Feature	Component Objective
Bewick's swan wintering population	No significant decrease in population against national trends, caused by on-site factors
Whooper swan wintering population	No significant decrease in population against national trends, caused by on-site factors
Golden plover wintering population	No significant decrease in population against national trends, caused by on-site factors
Bar-tailed godwit wintering population	No significant decrease in population against national trends, caused by on-site factors
Light-bellied brent goose wintering population	No significant decrease in population against national trends, caused by on-site factors
Great crested grebe wintering population	No significant decrease in population against national trends, caused by on-site factors
Cormorant wintering population	No significant decrease in population against national trends, caused by on-site factors
Greylag goose wintering population	No significant decrease in population against national trends, caused by on-site factors
Shelduck wintering population	No significant decrease in population against national trends, caused by on-site factors
Wigeon wintering population	No significant decrease in population against national trends, caused by on-site factors
Teal wintering population	No significant decrease in population against national trends, caused by on-site factors
Mallard wintering population	No significant decrease in population against national trends, caused by on-site factors
Eider wintering population	No significant decrease in population against national trends, caused by on-site factors
Red-breasted merganser wintering population	No significant decrease in population against national trends, caused by on-site factors
Oystercatcher wintering population	No significant decrease in population against national trends, caused by on-site factors
Lapwing wintering population	No significant decrease in population against national trends, caused by on-site factors
Knot wintering population	No significant decrease in population against national trends, caused by on-site factors
Dunlin wintering population	No significant decrease in population against national trends, caused by on-site factors
Curlew wintering population	No significant decrease in population against national trends, caused by on-site factors
Redshank wintering population	No significant decrease in population against national trends, caused by on-site factors
Waterfowl assemblage wintering population	No significant decrease in Waterfowl Assemblage population against national trends, caused by on-site factors
Waterfowl assemblage wintering population	Maintain species diversity contributing to the Waterfowl Assemblage

Feature	Component Objective
Habitat extent	Maintain or enhance the area of natural and semi-natural habitats potentially usable by Feature bird species. (2056.13 ha intertidal area) subject to natural processes
Habitat extent	Maintain the extent of main habitat components subject to natural processes
Roost sites wintering population	Maintain or enhance sites utilised as roosts

Lough Swilly SPA Conservation Objectives

The Conservation Objectives for this site are:

To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Lough Swilly SPA, which is defined by the following list of attributes and targets (note that this objective relates to all waterbird species of Special Conservation Interest).

Parameter	Attribute	Measure	Target
Population	Population trend	Percentage change	The long term population trend should be stable or increasing
Range	Distribution	Number and range of areas used by waterbirds	There should be no significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation.

To maintain the favourable conservation condition of the wetland habitat at Lough Swilly SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attributes and targets.

Parameter	Attribute	Measure	Target
Area	Subtidal, Intertidal, Supratidal and lagoon (and associated) habitat areas	Area (Ha)	The permanent area occupied by the wetland habitat should be stable and not significantly less than the areas of 4,162, 2,419. 201 and 317 hectares for subtidal, intertidal, supratidal and lagoon (and associated) habitats respectively, other than that occurring from natural patterns of variation.

Site selection species for the Lough Swilly SPA are:

Assemblage of over 20,000 waterbirds; whooper swan, Greenland white-fronted goose, greylag goose, shelduck, teal, mallard, red-breasted merganser, great crested grebe, oystercatcher, dunlin, curlew, redshank, black-headed gull (breeding) and common tern (breeding).

Additional species of Special Conservation Interest are wigeon, shoveler, scaup, goldeneye, heron, coot, knot, greenshank and common gull.

e

Lough Oughter Complex SPA Conservation Objectives

The Conservation Objectives for this site are

To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

Great crested grebe (wintering)

Whooper swan (wintering)

Wigeon (wintering)

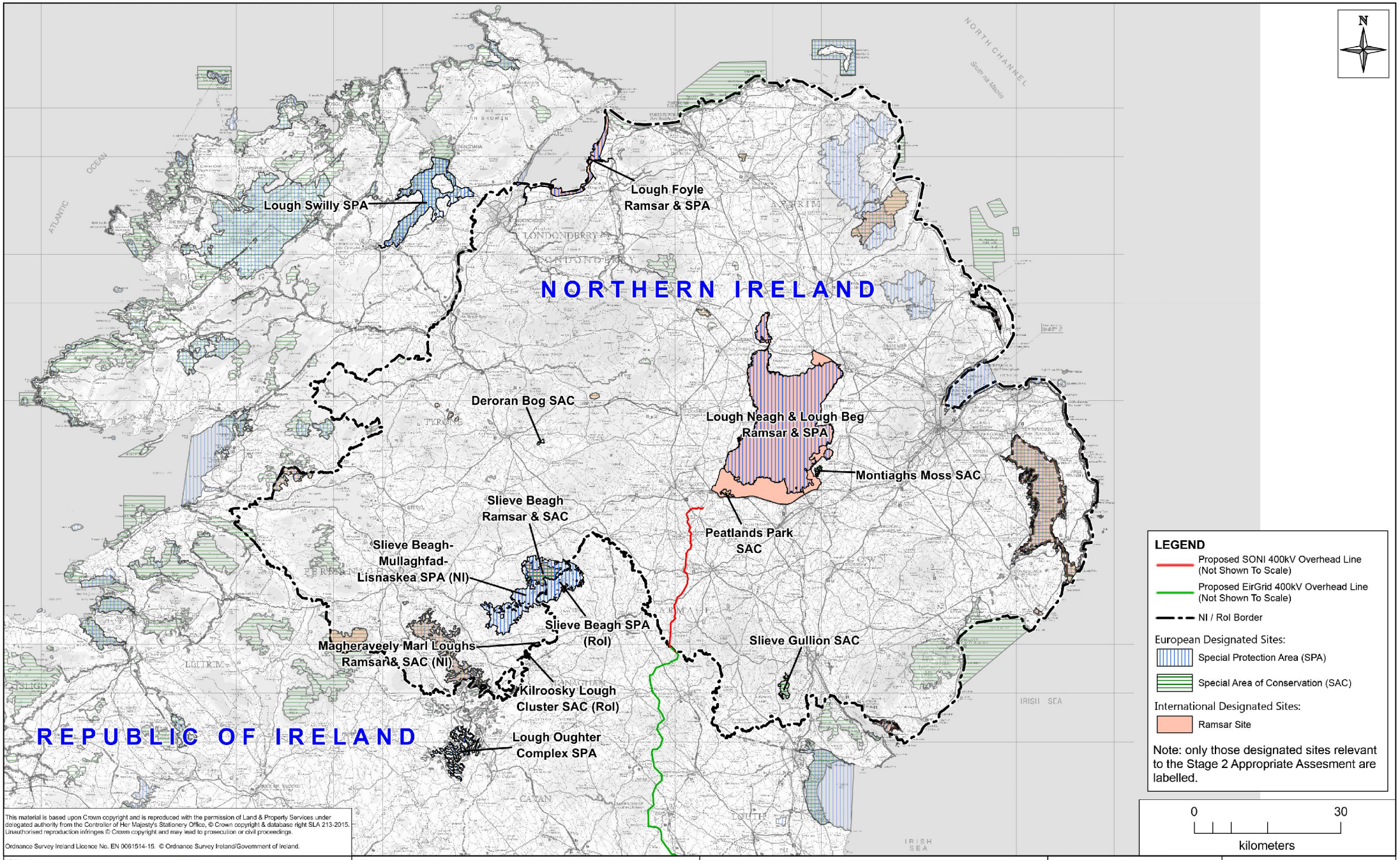
To maintain or restore the favourable conservation condition of the wetland habitat at Lough Oughter Complex SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

Annex B – Species Mentioned in Text

Common Name	Scientific Name
Birds	
Mute swan	*Cygnus olor*
Bewick's swan	*Cygnus columbianus*
Whooper swan	*Cygnus cygnus*
Greenland white-fronted goose	*Anser albifrons flavirostris*
Greylag goose	*Anser anser*
Light-bellied brent goose	*Branta bernicla hrota*
Shelduck	*Tadorna tadorna*
Wigeon	*Anas Penelope*
Gadwall	*Anas strepera*
Teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
Pintail	*Anas acuta*
Shoveler	*Anas clypeata*
Pochard	*Aythya ferina*
Tufted duck	*Aythya fuligula*
Scaup	*Aythya marila*
Eider	*Somateria mollissima*
Goldeneye	*Bucephala clangula*
Red-breasted merganser	*Mergus serrator*
Great crested grebe	*Podiceps cristatus*
Cormorant	*Phalacrocorax carbo*
Little egret	*Egretta garzetta*
Grey heron	*Ardea cinerea*
Coot	*Fulica atra*
Oystercatcher	*Haematopus ostralegus*
Golden plover	*Pluvialis apricaria*
Lapwing	*Vanellus vanellus*
Knot	*Calidris canutus*
Dunlin	*Calidris alpine*
Bar-tailed godwit	*Limosa lapponica*
Curlew	*Numenius arquata*
Greenshank	*Tringa nebularia*
Redshank	*Tringa tetanus*
Black-headed gull	*Chroicocephalus ridibundus*
Common gull	*Larus canus*
Sandwich tern	*Sterna sandvicensis*
Common tern	*Sterna hirundo*
Corncrake	*Crex crex*
Hen harrier	*Circus cyaneus*
Snipe	*Gallinago gallinago*
Red-throated Diver	*Gavia stellata*

Common Name	Scientific Name
Grey Plover	*Pluvialis squatarola*
Fish	
Pollan	*Coregonus autumnalis pollan*
Invertebrates	
White clawed crayfish	*Austropotamobius pallipes*
Freshwater pearl mussel	*Margaritifera margaritifera*
Marsh fritillary butterfly	*Euphydryas/Eurodryas/Hypodrya saurinia*
Blue mussel	*Mytilus edulis*
Freshwater shrimp	*Mysis relicta*
Lough Neagh Camphor Beetle	*Stenus palposus*
Ground Beetle	*Dyschirius obscurus*
Plants	
Bog Rosemary	*Andromeda polifolia*
Sessile Oak	*Quercus patraea*
English Oak	*Quercus pendunculate*
Silver Birch	*Betula pendula*
Downy Birch	*Betula pubescens*
Holly	*Ilex*
Fern	*Blechnum*
Eight-stemmed Waterwort	*Elatine hydropiper L.*
Marsh Pea	*Lathyrus palustris*
Irish Lady's tresses	*Spiranthes romanzoffiana*
Alder buckthorn	*Frangula alnus*
Narrow Small Reed	*Calamagrostis stricta*
Holy Grass	*Hierochloe odorata*
Great Fen-sedge	*Cladium mariscus*
Small-sedge fen	Caricion davallianae
Rough Stonewort	Chara aspera
Lesser Bearded Stonewort	Chara curta
Stonewort	Chara hispida
Hedgehog Stonewort	Chara pedunculata
Rugged Stonewort	Chara rudis

Annex C – Location Map



Client: SONI

Project: TYRONE TO CAVAN INTERCONNECTOR CONSOLIDATED ES ADDENDUM

Title: FIGURE 1: EUROPEAN AND INTERNATIONAL DESIGNATED SITES RELEVANT TO STAGE 2 APPROPRIATE ASSESSMENT

AECOM
9th Floor
The Clarence West Building
2 Clarence Street West
BELFAST BT2 7GP
Tel: 028 9060 7200
Fax: 028 9060 7399
www.aecom.com

Design:	GB	Drawn:	GB
Chk'd:	EB	App'd:	FL
Date:	MAR 2015	Scale:	1:700,000 @ A3

No: 60320996/3528/CESA/HRA/FIG1

Annex D – Outline Construction Environmental Management Plan

Appendix 9.1: Outline Construction Environmental Management Plan

(Revised 2015)

Contents

1.1 Executive Summary

1. The Outline Construction Environmental Management Plan (CEMP) has been updated in line with the change of applicant name from NIE to SONI and to include additional construction mitigation measures outlined in the Consolidated ES Addendum (2015).

2. As part of SONI's operational licence it is responsible for the planning of the proposed Tyrone - Cavan Interconnector. On completion of the planning phase of the project responsibility for the project will be handed to NIE. As the project proponent, NIE will have ultimate responsibility for the implementation of the CEMP and will work to ensure that the activities of its contractors are conducted in accordance with the mitigation measures set out in the Consolidated ES and Addendum and the conditions in the planning permission.

3. The contractor (who will be instructed by NIE) will be required to comply with mitigation measures outlined on the Consolidated ES and Addendum, which will be contractually enforced.

4. The Consolidated ES and Addendum have been prepared, inter alia, in order to outline the proposed mitigation measures which will be used to eliminate or minimise the impacts of the proposed Tyrone – Cavan Interconnector. The construction and operational phase for the substation, towers, overhead line and associated works has been assessed within the assessment chapters of the Consolidated ES and Addendum and mitigation measures proposed. These measures have been included in this Outline CEMP.

5. This Outline CEMP will be a key part of the construction contract to ensure that all mitigation measures, which are considered necessary to protect the environment, prior to construction, during construction and/or during operation of the proposed Tyrone – Cavan Interconnector, are fulfilled. NIE shall be responsible for ensuring that the contractor manages the construction activities in accordance with this Outline CEMP. The contractor will prepare a CEMP which is in accordance with the Outline CEMP to ensure that construction delivers the mitigation measures set out within this Consolidated ES and Addendum.

6. Objectives and measures are also included for the management, design and construction of the project to control the material impact of construction insofar as it may affect the natural environment and the natural environment, local residents and the public in the vicinity of the construction works. In order to achieve this, NIE and its contractor will adopt the objectives and control measures set out in this Outline CEMP with respect to:

   - Water Environment;
   - Soils, Geology and Groundwater;
   - Ecology;
   - Noise;
   - Cultural Heritage;
   - Landscape and Visual;
   - Community Amenity and Land Use;
   - Socio- Economics;
   - Telecommunications and Aviation Assets;
   - Flood Risk;
   - Transport;
   - Haulage Route Assessment (Addendum chapter);
   - Air and Climate Change (Addendum chapter).

1.2 Introduction

1.2.1 Purpose of a Construction Environmental Management Plan

7. The main purpose of a CEMP is to:

- Provide a mechanism for ensuring that measures to mitigate potentially adverse environmental impacts are implemented;
- Ensure that good construction practices are adopted throughout the construction of the proposed Tyrone - Cavan Interconnector;
- Allow for prompt response if any unacceptable adverse impacts are identified, with the provision of appropriate avoidance/and or mitigation measures as required in accordance with the Consolidated ES and Addendum;
- Provide a framework for compliance auditing and inspection to enable NIE to be assured that its aims with respect to environmental performance are being met.

1.2.2 The Proposed Tyrone - Cavan Interconnector

8. The proposed Tyrone - Cavan Interconnector is summarised below:

- The Proposed Substation: the construction and operation of a new 275kV / 400kV (source) substation at Turleenan townland, north-east of Moy, County Tyrone (hereafter referred to as the substation);
- The 275kV Towers: the removal of an existing 275kV suspension tower and the construction and operation of two new 275kV terminal towers, including the temporary diversion of the 275kV line, to provide for connection of the Turleenan substation to NIE's existing 275kV line;
- The 400kV Towers and Overhead Line: the construction and operation of a single circuit 400kV overhead transmission line supported by 102 towers for a distance of some 34.1km , from the source substation (at Turleenan) to a border crossing between the townlands of Doohat or Crossreagh, County Armagh and Lemgare, County Monaghan, where it will tie into the future ESB network. The overhead line will continue on in the Republic of Ireland with all further towers being proposed by EirGrid for placement within that jurisdiction. However, owing to geographic border definitions in the immediate area of the border crossing, there will be 200m of line oversail in the Northern Ireland townland of Crossbane; and,
- Associated Works: Works to include site levelling, site preparation works, modifying existing access points, construction of new access points, construction of new access lanes, construction of working areas, stringing areas, guarding, site boundary fencing, related mitigation works, formation of access tracks and other associated works at the substation and at the tower locations.

1.2.3 Construction Period and Stages

1.2.3.1 Construction Period

9. The construction period for the proposed Tyrone - Cavan Interconnector is anticipated to be up to three years from the start of the site works.

1.2.3.2 Overview of Overhead Line Construction Stages

10. The construction of the overhead line will be undertaken in five general stages, according to the following sequence, on a rolling programme of estimated durations:

- Stage 1 – Preparatory Site Work (1 - 7 days);
- Stage 2 - Tower Foundations (3 – 6 days);
- Stage 3 - Tower Assembly and Erection (3 – 4 days);
- Stage 4 - Conductor/ Insulator Installation (7 days); and,
- Stage 5 – Reinstatement of Land (1 - 5 days).

1.2.3.3 Overview of Substation Construction Stages

11. The substation construction can be split into seven stages:

- Site Entrance;
- Access Roads;
- Site Clearance, Landscaping and Preparation of Bund Construction;
- Install Drainage and Ducting;
- Construction of Roads and Bases within the Site;
- Installation of Equipment and Construction of Buildings; and,
- Completion of Access Road and Entrance, Including Final Surfacing.

1.3 Overview of Project Environmental Management

1.3.1 Environmental Management Principles

12. SONI views managing the environmental impact of its activities as an essential part of its business and is committed to a programme of environmental improvement.

13. SONI has an Environmental Policy which underscores the high priority that the company accords to environmental issues and sets goals for continual environmental improvements.

14. The policy framework commits the company to work to protect the environment and apply ways of minimising environmental impacts. Selected principles from the policy of immediate relevance to the proposed Tyrone - Cavan Interconnector are:

- To mitigate the impact of activities on the environment and develop procedures to prevent or abate any forms of pollution
- To promote the efficient use of resources and energy;
- To control waste management and recycling in a manner that reduces burden on landfill and maximises our reuse of materials;
- To commit, where possible, to environmentally sustainable procurement principles, and to encourage those principles throughout the supply chain.

15. The contractor (who will be instructed by NIE) will be required to comply with the principles of SONI's Environmental Policy and undertake this project in an environmentally sensitive manner and in particular (which will be contractually enforced) to:

- Meet the requirements of all relevant legislation, codes of practice and standards as identified in the Consolidated ES and Addendum;
- Limit the adverse environmental impacts as identified in the Consolidated ES and Addendum.

1.3.2 CEMP Development Responsibilities

16. As part of SONI's operational licence it is responsible for the planning of the proposed Tyrone - Cavan Interconnector. On completion of the planning phase of the project responsibility for the project will be handed to NIE. As the project proponent, NIE will have ultimate responsibility for the implementation of the CEMP and will work to ensure that the activities of its contractors are conducted in accordance with the mitigation measures set out in the Consolidated ES and Addendum and the conditions in the planning permission.

17. The CEMP will set out the arrangements for preventing, mitigating and controlling environmental issues and impacts by those carrying out the work and all others who may be affected by it, in accordance with the measures set out within this Outline CEMP.

18. The Contractor employed to undertake the construction of the proposed Tyrone - Cavan Interconnector will be responsible under legislation and the Contract, for minimising and controlling the potential environmental impacts of all Contract activities.

1.4 Project Environmental Mitigation

1.4.1 Overview

19. The main purpose of the Consolidated ES and Addendum is to identify environmental impacts with a view to avoiding, minimising or reducing them, particularly at the planning and design phase of the project. Project environmental mitigation will be detailed through the preparation of the CEMP in accordance with this Outline CEMP and Consolidated ES and Addendum.

20. Electricity transmission construction and reinstatement techniques that minimise environmental impacts are well established and when properly executed are unlikely to lead to any significant adverse long-term impacts. The techniques are identified within the Consolidated ES and Addendum which sets out the construction proposals with specific mitigation measures contained in the specialist chapters. Those measures are identified within this Outline CEMP.

21. All mitigation measures used during construction will be consistent with the measures set out in the Consolidated ES and Addendum and this document.

1.4.2 Construction Environmental Management Plan

22. The CEMP will contain :

- A statement of the environmental aims and policy objectives of the project;
- Relevant legislation and regulations that must be complied with;
- The real and potential environmental effects as identified in the ES;
- A schedule of environmental mitigation measures;
- Roles and responsibilities of key individuals;
- Environmental awareness training programmes;
- Environmental monitoring programmes and monitoring specifications;
- Inspection and auditing programmes; and,
- Reporting programmes and procedures.

1.4.3 Consultations

23. A range of consultations have been undertaken as part of the EIA with statutory and non-statutory bodies in order to ascertain the interests and concerns of key Consultees and authorities. The consultations provided useful information for formulating constraints avoidance and mitigation measures to be implemented to help reduce the impacts of greatest significance.

24. Consultation with relevant organisations will continue throughout all stages of the project and will focus on construction and mitigation measures to ensure that all necessary consents and licences are obtained.

25. The Contractor will be responsible for keeping a record of all of its consultations with statutory and non-statutory organisations including those with an environmental conservation mandate and for copying all correspondence (sent and received) and

meeting notes to NIE. It will be the Contractor's responsibility to prepare and update the consultation record.

26. Communication channels will be established and recorded within the CEMP to ensure that good relations are maintained with all parties potentially affected by the project. NIE and the Contractor will liaise with local communities, landowners and other interested parties.

27. The results of ongoing and future consultations will feed into the development of the CEMP including detailed restoration proposals and working method statements, consistent with measures set out in this Outline CEMP.

28. By way of example of the purpose of consultations, in recent consultations (2012), RSPB referred to Barn Owl Surveys and recommended that responsibility for appropriate surveys at a pre–works stage, in suitable nesting habitat such as at Artasooly Wood, is placed with the ecological clerk of works. These measures will be implemented by NIE.

1.4.4 Environmental Legislation, Policy and Guidance

29. There are numerous standards that will be incorporated into the CEMP to ensure that the potential environmental effects of the project are addressed. Issues relating to health and safety will be addressed in a separate Health and Safety Plan. Environmental management throughout the life of the Tyrone – Cavan 400kV Interconnector project will be dictated by a number of requirements including those:

- Prescribed in existing legislation (including the need for other licenses or permits);
- Established under industry codes of good practices;
- Contained within NIE Environmental Policy Statement and the requirements of ISO 14001;

1.4.5 Environmental Roles and Responsibilities

30. A Project Team organisational chart will be incorporated into the CEMP by the Contractor for the construction phase of the works.

31. It is an NIE requirement that there be a dedicated Environmental Officer attached to the NIE Project Team and an Environmental Representative with responsibility for environmental issues within the Contractor team identified prior to commencement of works.

1.4.5.2 Northern Ireland Electricity Environmental Management Team

32. The NIE Project Manager is supported on environmental issues by the NIE Environmental Officer. Environmental issues will be dealt with in accordance with NIE's Health, Safety & Environmental Procedures.

33. The NIE Project Manager is also supported by the following personnel:

- Land Agent;
- Wayleave Officer;
- Communications Advisor;
- Project Engineers; and
- Senior Transmission Inspectors.

1.4.5.3 Contractor's Environmental Management Team

34. The Contractor will for the contract, provide descriptions of the role of the Contractor's Environmental Representative and supporting staff, giving details of their specific environmental responsibilities and duties.

35. The descriptive roles, responsibilities and duties of these individuals will be duly incorporated into the CEMP. Any change of personnel will be subject to prior approval by the NIE Project Manager. In particular the Contractor will provide the names of the Contractor Environmental Representative and those environmental staff that may be available for monitoring, inspection and auditing with their relevant qualifications.

36. It is a NIE requirement that the contractor appoints as a minimum:

- An Environmental Representative dedicated to the project who has relevant Environmental and Transmission construction experience; and be available until complete reinstatement of the project has been achieved;
- An environmental Incident Response Team comprising as a minimum 2 trained people and an excavator based on the site and available during all construction hours;
- The Contractor shall also make available adequate spill kits, portable bunds and gas cages throughout the construction phase of the project.

1.4.6 Environmental Training and Awareness

37. The NIE Environmental Officer will support the NIE Project Manager in managing the provision of environmental training for NIE project personnel in accordance with ISO 14001 System Training Procedure.

38. The Contractor will:

- Be responsible for providing and recording induction training at the commencement of and throughout the construction phase of the project for the construction workforce;
- Be responsible for providing ongoing environmental awareness training and 'tailgate/toolbox talks' as appropriate for the work being conducted throughout the project;
- Maintain a record of all training provided and undertaken by all site staff;
- Prepare a Tyrone – Cavan 400kV Interconnector booklet containing the project's environmental rules and bullet points summarising good practice. This booklet will be submitted to the NIE Project Manager for review prior to the commencement of the construction phase and upon acceptance, will be issued to all site operatives and staff working on the project; and,
- Produce a 'Foreman's folder' containing site rules, the above mentioned booklet, environmental tailgate/toolbox talks, key environmental constraints; emergency response and reporting procedures and contact details; waste management procedures and the like relating to the project. The folder will be provided for all foremen working across the project as it is understood multiple teams may be working in different locations at the same time.

1.4.7 Site Waste Management Plan

39. The Contractor will develop a Site Waste Management Plan and procedures that will address the requirements set out in:

- The requirements of the Consolidated ES and Addendum;

- This Outline Construction Environmental Management Plan;
- The NIE Environmental Policy Statement on Waste Management; and,
- All current Local and National, International and Transfrontier waste management legislative obligations.

1.4.8 CEMP Environmental Management Procedures

40. The Contractor must set out within the CEMP procedures for managing, controlling and monitoring the environmental issues of the Project. The contractual requirement will require that the construction phase for this project will not start until the CEMP has been accepted by the NIE Project Manager or his nominee.

1.4.9 Documentation Retention for inspection

41. The Contractor is to retain the following documentation on site to be made available for audit and inspection by NIE and those persons authorised by NIE or any relevant regulatory authority:

- Relevant Environmental Procedures;
- Details of any protected land sites to be encountered during the works;
- Licenses associated with waste management and disposal;
- Waste transfer documents;
- Authorisation(s) for Consent to Discharge (as required).
- Construction Method statements;
- Tailgate/toolbox talks;
- Training Records
- Relevant Material Safety Data Sheets, (MSDS).

1.4.10 Audits and Inspections

42. Before construction commences, the Contractor will produce a programme of construction audits and inspections. This will include weekly and monthly inspections and a full audit at least once during the life of the project. The actual frequency will be agreed by the Contract Manager in conjunction with NIE Environmental Officer.

43. The Contractor will ensure that his schedule of internal audits and inspections covers the planning, design, site surveys/studies, and site investigation and construction phases. The Contractor is responsible for site environmental inspections and audits in accordance with the arrangements detailed in his Environmental Management System where relevant.

- The Contractor will detail arrangements for inspections and auditing (including sub-contractors); the preparation of checklists;
- The proposed inspection/audit programme;
- The reporting of non-compliances to NIE; and,

- Arrangements to ensure the close-out of actions.

44. All audit reports will be copied to NIE'S Project Management Team within 3 days of completing an audit.

45. The Contractor must demonstrate how the provisions of the CEMP are being complied with to NIE satisfaction. This will include a programme of monthly audits and daily site inspections by the Contractor's environmental staff.

46. NIE will reassure itself that the Contractor is complying with the CEMP by instigating inspection and monitoring and will conduct inspections to ensure that good environmental practice is being followed in all working areas

47. In addition to inspection, the CEMP and the Construction Team may be formally audited for environmental compliance

48. Both inspection and auditing results will play an important part in reviewing and updating the CEMP as the project develops.

49. NIE will undertake audits and inspections of its contractors' Environmental Management Systems.

1.4.11 Project Environmental Mitigation Measures

Table 21.1 of Chapter 21 of the Consolidated ES is replicated below and identifies the location, the construction mitigation measures, the timing of implementation of those measures and the monitoring requirements for each construction impact identified within the Consolidated ES for which NIE will be responsible.

The table has been updated to include construction mitigation measures from the Consolidated ES Addendum with regard to the haulage route assessment and air and climate change.

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
GENERAL CONSTRUCTION						
5.1	Substation	Noise mitigation of transformers	The transformers will be immediately south of the GIS building. They will be connected via underground cabling and will be contained by 12.5m high wall barriers on three sides. This is a fire protection and noise mitigation measure	Construction phase	None	
5.2	Substation	Mitigation of the drainage for the proposed substation site (hardstanding area and access road)	The drainage for the proposed substation site (hardstanding area and access road) has been designed in accordance with the Sustainable Drainage Systems (SuDS) principles and the Construction Industry Research and Information Association (CIRIA) SuDS Manual 2007. A three stage treatment to ensure water quality has been designed.	Construction and operational phases	Ongoing	
5.3	General	Mitigation of the existing field drainage systems (e.g. piped drainage pipes)	If existing drainage is discovered at the location of a tower foundation, typically this drainage will be removed from the tower foundation construction area. New drainage trenches will be dug on one or as many sides of foundation as required, or alternatively a number of drains can be replaced by a larger single drain inserted, which bisects the tower foundation. Any new drainage is based on a new site specific drainage design that will be completed by the appointed contractor and in agreement with the affected landowner(s)	Construction phase	None	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
WATER ENVIRONMENT (CHAPTER 8)						
8.1	Towers 20, 21, 33, 44, 48, 68, 78, 81, and 87	Reinstatement of ephemeral drainage ditch impacted during construction of the tower	Pre-construction survey to record existing conditions. Landscape proposals to reinstate ditch following completion of the works.	Following installation of the tower.	None.	Not applicable.
8.2	All construction sites	To prevent water pollution	Construction will be undertaken in accordance with best practice guidance, and any consents and licences required by regulatory bodies. Site specific mitigation measures will be developed following a risk assessment to be completed during detailed design. Section 8.5 of the Consolidated ES sets out a palette of mitigation measures that can be adopted to ensure that pollution does not occur.	During construction.	A monitoring strategy has been proposed during construction.	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
8.3	All construction sites	To prevent water pollution	A Pollution Prevention Plan, including an emergency response procedure, will be prepared. Any vehicles used on site will well maintained and checked daily. Drip trays will be fitted to static plant and biodegradable oil used. Spill kits will be stored on site and staff trained in their use. Concrete will be batched offsite. Fuel will be stored and refuelling activities will only take place in designated areas of the working areas. Concrete washing activities will also only take place in the working areas and wash waters collected for appropriate disposal offsite at a licensed land fill.	During construction.	A monitoring strategy has been proposed during construction.	
SOILS, GEOLOGY AND GROUNDWATER (CHAPTER 9)						
9.1	Construction area	Minimise impacts to soils	Controlling working practices, for example, by minimising land take to that required for the construction process; avoiding repetitive handling of soils; minimising vehicle movements off-road; and minimising the size of stockpiles to reduce compaction of soils. Re-instatement of soils to their original location, wherever practical.	Construction Phase	None	None
9.2	Construction area	Prevent spread of Potato Wart Disease (PWD).	NIE would contact DARD regarding the safe disposal or replacement of soils affected by Potato Wart Disease (PWD). Where off-site removal of infested soil is unavoidable, NIE would seek advice on the selection of suitable disposal sites and agree a methodology for the works prior to the issue of the necessary movement licence, which would include the measures to be adopted to prevent the spread of the disease. Even if affected soils are not removed off-site, NIE will agree with the Contractors measures to minimise the risk of spreading of the disease, such as cleaning the wheels of all lorries leaving the construction areas prior to accessing the public road and cleaning of all tools and earth-moving equipment after use in infested areas to avoid carrying infested soil onto unaffected agricultural land.	Construction Phase	None	None

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
9.3	Construction area	Effective treatment of spoil material	NIE would ensure that a methodology would be agreed for the disposal of all spoil arising from the excavations and that any disposal of the spoil on agricultural land would not be carried out without the benefit of appropriate permissions from the statutory authority (DOE and DARD).	Construction Phase	None	None
9.4	General	Dealing with unexpected contaminated land	Specific proposals would be prepared, following the granting of planning permission to facilitate the management of any contaminated material unexpectedly excavated as part of the construction of the development.	Pre-construction	None	None
9.5	Water well survey study area (approximately 300m from the tower locations).	Minimising impact to private water supplies	A water well survey would be carried out over an area approximately 300m from each tower location where dewatering will be required. If private wells, boreholes or springs are present in the survey area, an assessment would be carried out of the likely impact of dewatering pumping on the source and the need for the provision of a temporary alternative supply for the period of dewatering. Should the assessment show that there is a risk of derogation of an existing water supply source, a replacement supply would be provided. This may consist of the provision of a temporary supply, such as a water bowser, to ensure a continued water supply to properties.	Construction Phase	Monitoring required during construction	None
9.6	Substation	Controlling storage of materials	Impacts on groundwater following construction of the proposed Tyrone - Cavan Interconnector would be limited to issues associated with the storage and use of contaminants (i.e. oils and fuels) at the proposed substation. Provided that these substances are stored and used in accordance with standard guidelines and practices, potential risks to groundwater and surface water quality would be negligible.	Operational phase	Ongoing to ensure compliance	None

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
9.7	Substation	Minimise groundwater deterioration from sewage and foul water disposal	Use of septic tank soakaway. The soakaway drains will be appropriately located to allow attenuation of contaminants in the underlying unsaturated zone. There will be a minimum 2m of unsaturated ground below the soakaway drains.	Operational phase	None	None
9.8	Construction area	Minimise impacts from dewatering	(See Water Environmental Mitigation (Chapter 8) for details)	Pre - construction and Construction Phase	Ongoing during preconstruction and construction.	None
ECOLOGY (CHAPTER 10)						
10.1	General	To minimise impacts to Hedgerows and scattered trees	Works in the vicinity of trees should conform to BS 5837:2012, Trees in relation to design, demolition and construction- Recommendations. Hedgerows will be protected by scaffolding when conductors are drawn between towers. Where hedgerows in the vicinity of towers are to be lowered, a height of at least 2m should be retained in order to maintain bat flightlines. Minimal lengths of hedgerow should be removed where this is essential, and gaps should be replanted with native species following the works. Wherever possible, hedgerow trees will be pollarded rather than removed. New hedges of equal length planted where hedgerows removed (or donation made to conservation charity to plant replacement trees)			
10.2		To minimise impacts to Fen	Trampling and the use of machinery on saturated, quaking surfaces will be avoided.			

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
10.3		To minimise impacts to Breeding birds	Any removal/reduction of hedgerow trees, cutting of hedgerows and clearing of scrub will take place outside the bird-nesting period, which in Northern Ireland is generally taken as March to August inclusive. This will apply to both the construction and operational (line maintenance) phases. Potential bird nesting habitat in close proximity to works that take place between March and August should be checked by a competent ecologist to ensure that there will be no adverse impact on protected bird species.			
10.4		To minimise impacts to Wintering birds	Attachment of clearly visible markers on overhead lines posing a high collision risk. To be fitted to the earth line (highest line) between T30 and T43.			
10.5		To minimise impacts to Bats	A dusk and dawn bat survey will be carried out at potential roosts immediately prior to demolition/felling. If bats are found work will be suspended until consultation with NIEA. If bats are found after/during demolition/ felling work must be stopped until consultation with NIEA. Felling of potential roosting trees will be carried out in the presence of a licensed bat worker following best practice guidelines. 100 new bat boxes provided to mitigate for loss of potential tree roosts. Hedgerow replacement to compensate for loss of foraging habitat although all hedgerows will be cut to only 2m keeping commuting integrity intact.			

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
10.6		To minimise impacts to Badgers	Any excavations left unattended overnight should be either covered or ramped in at least one location to allow mammals to avoid becoming trapped. Repeat badger surveys will be carried out within 100m of the development immediately prior to the commencement of work. If setts are found work will be suspended until consultation with NIEA.			
10.7		To minimise impacts to Otter	Any excavations left unattended overnight should be either covered or ramped in at least one location to allow mammals to avoid becoming trapped.			
10.8		To minimise impacts to Irish hare	Any excavations left unattended overnight should be either covered or ramped in at least one location to allow mammals to avoid becoming trapped.			

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
10.9		To minimise impacts to Fish/Watercourses	Waters high in suspended solids produced as a result of de-watering during the excavation and construction of tower bases should be contained and treated prior to discharge. Treatment will be provided to intercept surface water draining from the substation site, and will intercept any suspended solids prior to discharge of water to a watercourse. The contractor will be required to provide a method statement designed to prevent adverse impacts on rivers and other watercourses. Tower locations will be sufficiently remote from watercourse channels, to ensure that work practices do not result in bank damage, and care will be taken to prevent ingress of silt into watercourses. Where crossing of watercourses for construction access is unavoidable, an initial draw-line will be flown across major rivers, which will then be used for winching the operational conductors to the tower position. The initial draw-line will be thrown across narrow watercourses, and a similar procedure followed.			
10.10		To minimise impacts to Smooth newt	Waters high in suspended solids produced as a result of de-watering during the excavation and construction of tower bases should be contained and treated prior to discharge. Treatment will be provided to intercept surface water draining from the substation site, and will intercept any suspended solids prior to discharge of water to a watercourse. The contractor will be required to provide a method statement designed to prevent adverse impacts on rivers and other watercourses. Tower locations will be sufficiently remote from watercourse channels, to ensure that work practices do not result in bank damage, and care will be taken to prevent ingress of silt into watercourses. Where crossing of watercourses for construction access is unavoidable, an initial draw-line will be flown across major rivers, which will then be used for winching the operational conductors to the tower position. The initial draw-line will be thrown across narrow watercourses, and a similar procedure followed.			

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
10.11		To minimise impacts to White clawed crayfish	Waters high in suspended solids produced as a result of de-watering during the excavation and construction of tower bases should be contained and treated prior to discharge. Treatment will be provided to intercept surface water draining from the substation site, and will intercept any suspended solids prior to discharge of water to a watercourse. The contractor will be required to provide a method statement designed to prevent adverse impacts on rivers and other watercourses. Tower locations will be sufficiently remote from watercourse channels, to ensure that work practices do not result in bank damage, and care will be taken to prevent ingress of silt into watercourses. Where crossing of watercourses for construction access is unavoidable, an initial draw-line will be flown across major rivers, which will then be used for winching the operational conductors to the tower position. The initial draw-line will be thrown across narrow watercourses, and a similar procedure followed.			
NOISE AND VIBRATION (CHAPTER 11)						
11.1	Development wide	To not exceed threshold values for airborne sound generated by construction activities at nearest noise sensitive receptors	Adopt best practice for construction of the substation and towers and limit hours of working	Construction	Occasional monitoring using type 2 Sound level meter at noise sensitive receptors.	Threshold for significant effects based on BS5228:2009

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
11.2	Development wide	To not exceed threshold values for ground borne vibration generated by construction activities at nearest noise sensitive receptors	Adopt best practice for construction of the substation and towers and limit hours of working	Construction	Occasional monitoring- vibration levels during construction phase will fall to typical ambient levels given separation distances	Threshold for significant effects based on BS5228:2009 and BS7385:1993
11.3	Development wide	To meet WHO Guidelines on Community noise	Limited number of HGV movements per hour or daily basis near to dwellings on haul routes	Construction	N/A	Assessed using haul road method in BS5228:2009. Takes account of HGV movements/ speed/distance from receptor
11.4	Development wide	To not exceed threshold values for noise and vibration under BS4142:1997, BS8233:1999, WHO Guidelines on Community Noise 1999 and BS5228:2009/BS7385:1993	Substation has significant attenuation due to structure and distance to nearest noise sensitive receptors	Operational	N/A.	External noise targets based on lowest recorded background noise levels near to the proposed substation

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
11.5	Development wide	To not exceed threshold values for noise and vibration under BS4142:1997, BS8233:1999, WHO Guidelines on Community Noise 1999 and BS5228:2009/BS7385:1993	Substation has significant attenuation due to structure and distance to nearest noise sensitive receptors	Operational	N/A.	External noise targets based on lowest recorded background noise levels near to the proposed substation
CULTURAL HERITAGE (CHAPTER 12)						
12.1	Development wide	To record any previously unrecorded archaeological remains.	Archaeological watching brief	Construction	Ongoing	
12.2	Site 71 (Near to Tower 91)	To ensure protection of the rath	Fence off prior to construction	Construction	During set-up and intermittently.	
LANDSCAPE AND VISUAL (CHAPTER 13)						
13.1	Substation site	Minimise landscape and visual impacts	Landscape proposals (including earth mounding) are proposed at the substation site. Proposed planting would be implemented in the first planting season following completion of the earth works Plant species chosen would be fast growing native species to complement existing planting in the local area. The planting would be protected by rabbit proof fencing and would be subject to a management program to ensure objectives are met.	Construction Phase	Ongoing maintenance	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
13.2	Substation	Minimise landscape and visual impacts	Complete earth mounding and planting prior to the installation of substation components. Provide the minimum height of bunds to immediately screen the lower construction elements. Grade new landforms gradually into existing surrounding levels. New planting to complement existing visual character - use indigenous hedge and trees along with fast growing nurse and climax trees. Minimise the use of roadside signs relating to the completed development. All metal security fencing would be finished in galvanised/painted grey. Other field enclosures would be timber post with appropriate galvanised wire, and planted with local hedge and tree species, to match existing. Security lighting will be activated by movement sensors only and will be located to minimise lighting spillage and pollution on the local area. Reflective finishes on all construction elements have been avoided. To further reduce the visual impact, the buildings have been designed to complement the building appearance and character local to the area, with particular regard to their scale, form and finish, as detailed in Chapter 5 of the Consolidated ES.	Construction and Operational Phase	Ongoing maintenance	
13.3	Tower Working Areas	Restoration of affected vegetation post construction	At the end of the construction process, land affected by the working areas would be fully reinstated as pasture or planted to replace any vegetation lost as a result of the works. Care would be taken to ensure there would be no remaining areas of compacted land. Any fencing and/or hedging removed to accommodate working areas or access tracks would be replaced to an equivalent or better quality in keeping with the rural landscape upon completion of the construction period.	Construction Phase	Five year maintenance period (to be agreed with landowner)	
13.4	Temporary access tracks	Restoration of affected vegetation post construction	Temporary access tracks and track-ways would be reinstated following construction.	Construction Phase	Five year maintenance period (to be agreed with landowner)	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
13.5	Temporary Access Widening and Visibility Splays	Restoration of affected vegetation post construction	If it is determined by the Department that temporary traffic measures are not to be used, existing accesses could be temporarily enlarged to accommodate the larger types of construction vehicles. The area of affected vegetation would be reinstated.	Construction Phase	Five year maintenance period (to be agreed with landowner)	
13.6	Temporary Low Voltage crossings	Restoration of affected vegetation post construction	There are 18 existing electricity lines to be undergrounded, which will be undertaken by open trench. This will result in an impact to 89m of hedgerows and treelines, which will be reinstated post construction	Construction Phase	Five year maintenance period (to be agreed with landowner)	
13.7	Permanent Tower Bases	Restoration of affected vegetation post construction	The permanently affected area of the towers is smaller than the required construction area. Of the area affected by construction, roughly 66% can be reinstated post construction. It is possible for vegetation including hedgerows to grow under each of the proposed towers; however as worst case it has been assumed that 296m of hedgerows and treelines and 3 trees will be permanently lost	Construction Phase	Five year maintenance period (to be agreed with landowner)	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
13.8	Permanent area adjacent to the overhead line	Restoration of affected vegetation during operational phase	All vegetation adjacent to the conductors with the potential to fall onto the conductors will be trimmed to ensure safety clearances. This will form part of the ongoing maintenance of the proposed Tyrone - Cavan Interconnector. This is standard practice and is done for all existing overhead lines. Less trimming will be required further from the conductors as there will be less potential for falling vegetation onto the overhead line. The trimming regime will involve a scalloping or profiling effect which will minimise the effect on vegetation. It is assumed that an area of 30m from the edge of the conductors (on either side) will be required to be examined for falling hazards. The level of trimming required will be directly related to the distance from the overhead line and the height of the vegetation - i.e. the further from the overhead line, the less vegetation that is required to be trimmed. The vast majority of this vegetation within the 30m zone will be unaffected because of its height and distance from the overhead line but for safety reasons, any branches, etc with the potential to fall on the overhead line will be trimmed. Hedgerows within the 30m zone are currently regularly maintained by landowners to an approximate height of between 1m and 3m and so will not require further trimming.	Operational Phase	Ongoing maintenance	
COMMUNITY AMENITY AND LAND USE (CHAPTER 14)						
14.1	Construction phase	Minimise traffic disruption to residential, commercial and community facilities	Maintain access to residential, commercial and community facilities during construction including recreational routes such as walking and cycling routes.	Construction phase	None	See Chapter 18
14.2	Construction phase	Minimise disruption to road using community events	Roads to be maintained during construction and to be left in a condition suitable for current road use community events (e.g. road bowls). Liaison will be undertaken with community groups as appropriate to ensure mitigation of any disturbance to access.	Construction phase	None	
14.3	Construction phase	Minimise disruption to existing services	Interruptions to electrical and telephone lines should be kept to a minimum with notice given to the affected users.	Construction phase	None	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
14.4	Construction phase	Fencing of substation site to prevent disruption	The site of the proposed substation will be fenced off prior to construction to ensure that the construction activities within the site have no impact on adjoining farm land.	Construction phase	None	
14.5	Construction phase	Landowner Liaison	An access officer will be appointed by the contractor to liaise with the landowners along the line route and ensure that their requirements for entry are met so far as is possible	Construction phase	None	
14.6	Construction phase	Maintain access to agricultural land	NIE will ensure that land owners have reasonable access to all parts of their farm during the construction phase to minimise or eliminate temporary farm fragmentation impacts. Where existing access roads are affected or fenced off, NIE will make all reasonable efforts to provide alternative access.	Construction phase	None	
14.7	Construction phase	Reinstatement of Hedgerows and drains/ditches	Hedgerows and drains/ditches should be reinstated after completion of works as far as is practical	Construction phase	None	
14.8	Construction phase	Follow disease protocols	Disease protocols will be adhered to and NIE will comply with any DARD regulation pertaining to animal or plant diseases. Before surveying commences the land owners will be met and a pre-survey interview will be completed. The purpose of this interview is to ask the land owner to notify NIE of any animal diseases and other risks which may arise from dangerous livestock (e.g. bulls);	Construction phase	None	
14.9	Construction phase	Landowner Notification	Farmers will be notified at least 1 week in advance of any works commencing on their farms. The contractor will make all reasonable efforts to accommodate the farmers grazing and cropping programmes and reschedule works if practical to do so.	Construction phase	None	
14.10	Construction phase	Agronomy pre-condition	An agronomy pre-condition survey will be carried out	Construction phase	None	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
14.11	Construction phase	Fencing of construction areas to prevent disruption	Appropriate fencing will be erected to exclude livestock from sites of construction and to keep livestock within farm boundaries	Construction phase	None	
14.12	Construction phase	Minimise impact of rock breaking or pilling ,if required	Where rock breaking or pilling are required, owners of livestock in adjoining fields will be notified in advance.	Construction phase	None	
14.13	Construction phase	Minimise impacts to land drains	Land drains which may be potentially affected during tower foundation excavations and excavations for undergrounding will be redirected and/or reconnected in a manner that maintains existing land drainage. Before surveying commences the pre-survey interview with land owners will identify location of drains	Construction phase	None	
14.14	Construction phase	Minimise impacts to soil	All disturbed field surfaces will be reinstated. These works may be carried out by the land owner, the contractor or an agreed third party, as agreed with the land owner. Works will not be carried out following extreme rainfall to minimise damage to soil surface and minimise run-off risks. All soil disturbance works and remedies will comply with agreements made with land owners	Construction phase	None	
14.15	Construction phase	Minimise impacts from concrete	Concrete will be mixed off-site and imported to the site. The pouring of concrete for tower bases will take place within a designated area using a geosynthetic material to prevent concrete runoff into the surrounding soil. Any soil contaminated by concrete spillage will be removed to an approved waste facility	Construction phase	None	
14.16	Construction phase	Minimise impacts from pumped water	If water is being pumped from a construction site, a water filtration system will be utilised to minimise impacts on water sources.	Construction phase	None	
14.17	Construction and Operational phase	Ensure Health and Safety	NIE will provide safety information directly to all affected land owners. Anti-climbing platforms will be installed on all towers to prevent people climbing the towers	Construction phase	None	
14.18	Construction and Operational phase	Minimise impacts to electric fences	In rare cases where electric fences induce an electrical current, electric fence filters will be installed	Construction phase	None	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
SOCIO-ECONOMICS (CHAPTER 15)						
15.1	Construction and Operational phase	Minimise impacts to the Linwoods bioremediation area	Mitigation measures will be required to minimise the impact to the bioremediation area. Further consultations will be required with the owner and operator of the area. It may be possible to accommodate the normal harvesting operation within the construction timetable in order to minimise losses. If this is not possible, compensation will be required for the loss of the value of the crop. In terms of the effluent treatment, consultations with the owner and operator in order to determine the layout of the pipe network and what remedial works will be required during construction and the operation of the proposed Tyrone - Cavan Interconnector. The consultations will also be needed to determine the nature of the effluent material, the rate of production from the facility, rate of discharge and the current condition of the treatment system. It is likely that alterations will be required to the pipe network, which is currently laid above ground along the rows of planted willow. If there is not capacity in the treatment system to accommodate a reduction in the willow area, alternative treatment will have to be agreed with the owner and operator (e.g. off site treatment by tanker) or compensation agreed.	Construction and Operational phase	None	
TELECOMMUNICATIONS AND AVIATION ASSETS (CHAPTER 16)						
16.1	Construction and Operational phase	To ensure no impacts to TV and radio reception	In the unlikely event of interference arising, adjustments to the orientation of the aerial of the radio or television or a similar solution should remedy the problem. No mitigation is proposed as part of this EIA.	Construction and Operational phase	Monitoring through any public complaints to NIE.	This has been assessed to be unlikely to occur.

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
16.2	Construction and Operational phase	To ensure no impacts to aviation	Prior to construction, the Defence Geographic Agency (DGA) (the body responsible for maintaining the aviation mapping database for the CAA and MoD) will be provided with detailed mapping of the proposed Tyrone - Cavan Interconnector. (both construction and operation phase details). The Irish Aviation Authority will also be informed.	Construction and Operational phase	None	
FLOOD RISK ASSESSMENT (CHAPTER 17)						
17.1	Substation	Prevent increased runoff rates and volume	Implement Surface Water Management Strategy	During Construction	None	
17.2	All Construction Locations	Prevent increase flood risk during construction from dewatering activities	During flooding events, dewatering activities to be ceased to avoid increased discharges	During construction	None	
17.3	All Construction Locations	Prevent loss of floodplain	Ensure that any excavated material is not stored within the floodplain	During construction	None	
TRANSPORT (CHAPTER 18)						
18.1	Entrance to 31 No. listed access tracks.	Traffic Management measures	Traffic Management measures at site access - 31No. access tracks including AT2, AT10, AT14, AT20, AT24-25, AT26, AT29, AT33, AT35, AT43, AT45, AT47A, AT48A, AT49, AT51, AT52, AT52SL, AT54, AT67, AT71SL2A, AT74SL2, AT76, AT80, AT86, AT87B, AT88, AT89, AT90, AT93-94, AT99 and AT100.	Construction Phase	None	
18.2	Entrance to 5 No. listed access tracks and to feeder road	Traffic Management measures	Traffic Management measures required at site access and also en route to the access from the feeder road - 5No.access tracks including AT75, AT97, AT98, AT102A and AT102B.	Construction Phase	None	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
18.3	Entrance to17 No. listed access tracks.	Access widening	Access requires widening to accommodate construction vehicles - 17No. access tracks including AT7, AT13, AT18, AT19, AT30, AT34, AT41-42, AT50, AT78A, AT78B, AT79, AT81, AT82, AT83A, AT83B, AT84 and AT91.	Construction Phase	None	
18.4	Entrance to 3 No. listed access tracks and to feeder road	Access widening and traffic management measures	Access requires widening to accommodate construction vehicles and traffic management measures required en route to the access from the feeder road - 3No. access tracks including AT74A, AT74SL1 and AT74SL2	Construction Phase	None	
18.5	Entrance to 101 listed access tracks (all proposed)	Access widening in-line with DCAN 15 advice	If it is determined by the Department of the Environment that temporary traffic measures are not to be used and existing accesses should be temporarily enlarged to DCAN 15 standards, then measures 18.1 to 18.4 will be superseded by this mitigation measure - 18.5. The low-loaders could enter the proposed sites and make deliveries off the public road network without requiring road or lane closures. The area required for the temporarily enlarging the existing accesses has been identified and included within the planning application boundary. Where the accesses are required to be widened to accommodate construction machinery, vegetation will be cleared and any affected services and drainage will be amended to ensure normal operation during the construction phase.	Construction Phase	None	
18.6	General	Construction Traffic Management Plan	Prior to construction, a Construction Traffic Management Plan would be prepared and submitted to Roads Service for consideration following consultation with other stakeholders such as the Police Service of Northern Ireland. An outline plan has been drawn up at this stage; see Annex 10 of Annex 12 of Appendix 18A. However, the appointed contractor would finalise this traffic management plan with Roads Service and adhere to its detailed during the construction of the line.	Construction Phase	None	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
18.7	General	Travel Plan Framework	Notwithstanding a Travel Plan Framework has been developed, which includes measures related to the proposed substation. The measures include providing a staff notice board detailing sustainable transport modes and all HGVs visiting the site will be provided with information regarding suitable 'haul routes' before undertaking their journeys.	Operational Phase	Ongoing to ensure effectiveness	
HAULAGE ROUTE ASSESSMENT (Consolidated ES Addendum)						
AH1	General	Traffic Management Plan	Plan the movement of the abnormal load for a Sunday when the road network is typically at its quietest;	Construction Phase	Ongoing to ensure effectiveness	
AH2	General	Traffic Management Plan	Appropriate Police or contractor escort to accompany movement of the abnormal load to be agreed with the local authorities and police where appropriate;	Construction Phase	Ongoing to ensure effectiveness	
AH3	General	Traffic Management Plan	Identification and advanced notification to key stakeholders(those who may be greatly impacted by the load movement);	Construction Phase	Ongoing to ensure effectiveness	
AH4	General	Traffic Management Plan	Advanced notification to the general public warning of the abnormal load transport movement;	Construction Phase	Ongoing to ensure effectiveness	
AH5	General	Traffic Management Plan	Informative road signage warning other users of traffic movements;	Construction Phase	Ongoing to ensure effectiveness	
AH6	General	Traffic Management Plan	Specific timing of the movement outside of peak traffic hours and avoiding specific events that may be impacted adversely;	Construction Phase	Ongoing to ensure effectiveness	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
AH7	General	Traffic Management Plan	Identification of locations on the route where the load may be stopped or directed to one side of the carriageway to allow traffic to pass;	Construction Phase	Ongoing to ensure effectiveness	
AH8	General	Traffic Management Plan	Identification of diversionary routes for road users with approximate timings to specific (key) destinations;	Construction Phase	Ongoing to ensure effectiveness	
AIR AND CLIMATE CHANGE (Consolidated ES Addendum)						
AA1	General	Traffic Management Plan	Specific diversions for A29 north and south bound traffic avoiding the village of Moy where the A29 will be temporarily blocked for potentially 24 hrs; and,	Construction Phase	Ongoing to ensure effectiveness	
AA2	General	Communication	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary, and the regional office contact information.	Construction and operational phases	Ongoing	
AA3	General	Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	Construction and operational phases	Ongoing	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
AA4	General	Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby to monitor dust and record inspection results. Carry out regular site inspections to monitor compliance with the CEMP and record inspection results. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	Construction and operational phases	Ongoing	
AA5	General	Preparation	Plan site layout so that machinery and dust causing activities should be located away from receptors as far as is possible. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any permanent stockpiles on site. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period Avoid site runoff of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible. Cover, seed or fence long-term stockpiles to prevent wind whipping.	Construction and operational phases	Ongoing	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
AA6	General	Operating Vehicles	Ensure all vehicles switch off engines when stationary with no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	Construction and operational phases	Ongoing	
AA7	General	General Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction. Ensure an adequate water supply on the site for effective dust suppression. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Construction and operational phases	Ongoing	
AA8	General	Demolition	Ensure effective water suppression is used during demolition operations. Bag and remove any biological debris or damp down such material before demolition.	Construction phase		
AA9	General	Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian or mulches where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Only remove the cover in small areas during work and not all at once	Construction and operational phases	Ongoing	

Item	Location	Mitigation Objective and Commitment	Mitigation Measure	Timing of Mitigation Measure	Monitoring Requirements	Comment
AA10	General	Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	Construction phase		
AA11	General	Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Record all inspections of haul routes and any subsequent action in a site log book. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Construction and operational phases	Ongoing	

ENDS

Annex E – List of Planning Applications Examined for In-Combination Effects

- M/2011/0652/F Erection of 1 no. 50 kW wind turbine with a hub height of 36.5 m to supply farm business;
- M/2008/0797/F Erection of 1 no. wind turbine;
- M/2010/0412/F Proposed installation of a GAIA (11kW) wind turbine on a 18 m high lattice tower type mast;
- M/2010/0589/F 24.8 m height 11kW white wind turbine with galvanised steel lattice tower for domestic use;
- M/2011/0465/F Erection of wind turbine (32.3 m hub height 30 m blades);
- M/2010/0913/F Erection of a Wind Turbine (50 kW Max) With a Tower height of 30 m;
- M/2009/0940/F Proposed wind turbine 1 Gaia Wind 11 kW turbine (18.3 m lattice tower construction);
- M/2008/0464/F Proposed 24 m High (10kW) domestic wind turbine;
- O/2011/0364/F Proposed erection of wind turbine with 30 m hub height and 30 m rotor diameter with a maximum output not exceeding 250 kW;
- O/2006/1142/F Erection of 33 m high wind turbine;
- O/2010/0406/F Installation of 50 kW wind turbine on 36.6 m high free standing steel mast;
- O/2010/0646/F Proposed new 20kW wind turbine on 18 m mast;
- O/2011/0195/F Erection of a single 250 kW wind turbine of 40 m tower height (55 m to tip) and control room;
- O/2007/0796/F Erection of 1 No. wind turbine 33 m high with associated site works;
- O/2010/0212/F 600 mm diameter radio transmission dish mounted on steel pole fixed to existing facade of building;
- O/2007/0374/F 15 m high 6 kW proven wind turbine for domestic use at 90 Clay Road, Keady;
- O/2007/0449/F Erection of a 15 m High 6 kW wind turbine for domestic and agricultural use at 44 Tievenamara Road;
- O/2011/0401/F Proposed 2 No. free range poultry sheds with 4 No. feed bins;
- O/2011/0539/F Replacement poultry shed with 2 No. feed bins to contain 35,000 egg laying hens in enriched cages;
- O/2011/0412/F Proposed free range poultry shed generator store and feed bin (amended scheme to include 6 passing bays);
- M/2012/0340/F Proposed 2 No. select farm poultry sheds 4 No. feed bins and an ancillary building with biomass boiler, standby generator, office and changing facilities (each poultry shed will contain 25,850 chickens);
- O/2012/0234/F Erection of 1 no. chicken house (22,600 birds);
- O/2003/0276/A4 Proposed new chicken house;
- O/2010/0490/F Proposed free range poultry shed generator store and feed bin;
- M/2010/0717/F Proposed 2 No. poultry houses (each containing 23,000 chickens) 4 No. feed bins and an office, changing & generator building;
- M/2008/0143/F Proposed chicken house (planning permission expired May 2013);
- O/2009/0807/F Erection of 1 No. free range organic chicken house;
- O/2009/0805/F Erection of 1 No. free range organic chicken house;
- O/2009/0804/F Erection of hen house;
- M/2010/0487/F Proposed additional free range poultry shed and feed bin (to contain 6,000 free range egg laying hens);
- O/2011/0067/F Proposed Wind Turbine, hub height 40m;

- M/2012/0432/F Proposed Wind Turbine, hub height 32m;
- O/2013/0157/F Proposed Wind Turbine;
- O/2013/0464/F Proposed Wind Turbine;
- O/2013/0397/F Proposed Wind Turbine;
- O/2013/0259/F Proposed Wind Turbine;
- 10416 (Monaghan County Council Planning Reference) Four wind turbines of hub height 85 m and associated development (This planning application redesigns the permitted wind farm granted on site under Reg. ref 04/1207/ABP ref PL18.218484);
- 10480 (Monaghan County Council Planning Reference) 1) demolish existing farm buildings; (2) erect a poultry unit, manure store and egg store; (3) insert a holding tank and two number meal bins; and,
- 11358 (Monaghan County Council Planning Reference) To erect a second poultry rearing house.