## Technical Appendix 1.4: Potential Grid Connection Route

## Introduction

## The Consenting Context

- 1. Although a grid connection is an integral, requisite part of any wind farm project, it typically follows a completely separate consenting route. Depending upon its scale and significance, consent for the wind farm grid connection is sought either from the relevant system operator of the local distribution or transmission network, in this case Northern Ireland Electricity Ltd (NIE) or System Operator for Northern Ireland Ltd (SONI).
- 2. The Best Practice Guidance to PPS 18 states that whilst the routing of such lines by NIE or SONI is usually dealt with separately to the application for the wind farm, developers will generally be expected to provide details of indicative routes and method of connection.
- 3. Any Environmental Impact Assessment should assess the complete project, rather than a portion thereof and this is the purpose of this Technical Appendix.
- 4. This chapter contains the following:
  - Appendix A Figure Appendix 1 is referenced in the text as appropriate.
  - Appendix B Heritage assets reviewed as part grid route assessment, including Figures 1.1 to 1.4

### Potential Grid Connection

- 5. Given the consenting context the exact means of grid connection is unknown at the time of writing. However, based on RES's knowledge of the grid connection system and NIE's and SONI's published plans for future upgrades, RES has been able to undertake an assessment to determine the grid connection option most likely favoured by the network operator, which is proposed to be the indicative North Sperrin Scheme Substation.
- **6.** The Proposed Development would be connected by approximately 20.5 km of underground cable to the indicative North Sperrin Scheme Substation.
- 7. The route would begin at the wind farm substation within the proposed development, and would follow site tracks North towards the site entrance, from where it would then meet the public road corridor of the Carrickayne road. The route travels right, before making a left hand turn onto which is commonly known as the 'Ramper' road. The route continues along the 'Ramper' before making a right hand turn onto the Lisnaragh road. The route takes a right hand turn at Ballymallaght, onto the Aghafad road, which then continues on to the Ballynacross road. The route takes a right hand turn onto the Longland road, before taking another right hand turn onto the Glenshane road (B74). The route continues along the Glenshane road, before making

a left-hand turn onto the Ballyhanedin road. It is expected that the indicative North Sperrin Scheme Substation will be located off the Ballyhanedin road, however as the North Sperrin Scheme is itself still in development and will be subject public consultation, the location of the substation may be subject to change. For an underground cable connection, the final trench design would be subject to outcome of site surveys but would be similar typical NIE HV cable trench design, as shown in Volume 3 Figure 1.17. The trench will be approximately 0.6 m - 0.75 m wide and approximately 1.3 m deep and could run in the road side verges adjoining the carriageway, or within footways adjoining the carriageway, although it is also possible that the cable would be laid within the carriageway itself. Cables would typically be laid to a depth of 0.75m to 1.2 m. To lay this cable a trench is dug, bedding material, normally sand, is placed along the trench-base, the cable laid and then covered with more sand. The cables are then protected by a layer of protective plastic covers and then backfilled with subsoil and original topsoil and turfs.

- 8. For bridge crossings along the road, the cable could be laid within the bridge, if there is sufficient excavation depth, or otherwise via directional drilling under the watercourse.
- 9. The construction activities would include the following:
  - Clearance of land (including vegetation strip as appropriate)
  - Digging of trenches
  - Backfilling of trenches and remediation.
- 10. The land should be reinstated as near as reasonably practicable to its original condition.
- 11. It is anticipated that the works would be implemented by NIE using its permitted development rights as a statutory undertaker.

## Potential Impacts

- 12. An assessment of the likely significant environmental impacts of the proposed underground grid connection route has been undertaken under the following headings:
  - Landscape and visual
  - Cultural heritage and archaeology
  - Vegetation & Terrestrial fauna
  - Ornithology
  - Geology and the water environment
  - Noise
  - Traffic and transport

## Landscape and Visual

13. The route of the grid connection within the proposed site would follow that of the site tracks and have no additional landscape or visual effects. Land cover on the site comprises open moorland and there would therefore be no loss of trees or hedgerows. The road corridors forming the route of the proposed grid connection to the North Sperrin Substation near Ballyhanedin Road are characterised by a combination of open areas with rough grass verges and post and wire fences; scrubby vegetation including gorse, willow and birch; individual and stands of mature and semi-mature trees including Ash, Oak, Sycamore and pine; individual and clusters of rural properties with garden walls, fences and hedgerows and some footpaths. In all instances the installation of cables within the road corridor would be preferable as this would cause negligible disturbance to the existing landscape and visual character and, in most instances, this is expected to be a feasible option. However, where there are wide grass verges, footpaths and post and wire fences adjacent to the road corridor, these could be easily removed and replaced like-for-like with minimal effects if necessary. Areas of gorse and willow scrub could also be replaced with only short-term effects. However, the removal or root disturbance of mature trees and hedgerows should be avoided as this would have longer term effects and these features are more valuable elements of landscape and visual character. In particular, the removal of existing healthy Ash trees should be avoided where possible because it would not be possible to replace Ash species due to potential risks from Ash Dieback disease. Disturbance to tree roots should be avoided through the careful excavation of the cable route and the mitigation measures outlined in Table 3 where relevant.

## Archaeology & Cultural Heritage

#### Policy Context

- 15. A detailed desktop survey was undertaken for the proposed grid connection routes, which consisted of a review of available archaeological and heritage data within 500m of the cable route (the search area). This entailed a review of the Sites and Monuments Records, the Industrial Archaeological Records, the Historic Buildings Archive, the Historic Gardens Register and the Defence Heritage Records, which are maintained by the Department of the Communities Historic Environment Division (DfC: HED).
- **16.** The identification of historic environment constraints is based solely upon the results of the desk-based assessment. No field survey was carried out at this stage of the assessment.

#### Cultural Heritage Baseline

17. The search area for the cable route was reviewed and a total of six listed buildings, four scheduled monuments, eight industrial historic assets and nineteen archaeological monuments are located within this area. Appendix A contains Figure 1.4.CH1 which shows the route of the proposed grid connection and the location of cultural heritage assets within the search area. The heritage assets considered as part of this assessment are listed in Appendix B.

#### Archaeological Potential

- 18. A review of the cultural heritage baseline confirms that neither cable route would physically affect any listed building, scheduled monument, or other designated heritage asset of high importance. The route of the cable connections also follows existing roads, and roadside locations, which are areas that will have already been impacted by the construction of the roads along the route. As such it is considered that the cable route has a low potential to contain buried remains of high significance, that would require an alteration to the proposed route.
- **19.** The route does however pass over two bridges which are noted as industrial heritage assets:
  - Londonderry Clegan/Killycor Bridge (IHR 01936:000:00)
  - Londonderry Straid/Tirglassen Bridge (IHR 01949:000:00)
- 20. There is also a general potential for the presence of other, as yet unknown remains along the route, however any remains will have been either damaged or removed by the construction of the roads, so would be fragmentary and of limited interest.

#### Construction Phase Effects

21. The impact of the construction of the cable route would be highly localised, consisting of a single trench excavated through areas which have already been disturbed by previous development. As has been noted above, any buried

archaeological remains which may be present under the road would be fragmentary and of low significance.

- 22. Therefore, the impact to any buried remains under the existing road would be low, and would amount to no more than a minor adverse degree of effect as defined in Chapter 5, Table 5.2. This would result in a slight adverse significance of effect in relation to these remains (Table 5.4).
- 23. The cable trench would be excavated into the modern road surface of the bridges noted above. If insufficient depth of such modern fill is available, then the route will proceed alongside the bridge, with directional drilling employed to run the cable under the watercourse. Therefore, the proposed development would not result in a loss of the historic fabric of the bridges, nor would it affect their form, function or historic interest. On this basis it is considered that the proposed development would have a neutral effect on these structures (Table 5.4).

#### Operational Phase Effects

**24.** As the grid connection consists of entirely below ground elements, there is no potential for operational impacts on cultural heritage assets, as any physical effects would have already been completed, and no indirect visual effects would be noticeable.

#### **Mitigation measures**

- **25**. The minor impacts resulting to any buried archaeological remains present under the roadway, or roadside along the cable route could be adequately compensated for by a programme of archaeological monitoring and recording during the excavation works along the route. This would allow the archaeological interest of the remains to be better understood.
- 26. With the benefit of the mitigation measures outlined, the significance of effect to any buried archaeological remains which may be present within the cable routes would be reduced to neutral as defined in Chapter 5 Table 5.4.

#### Conclusions

27. This assessment has found that the construction of the cable connection would have no more than a slight adverse significance of effect on cultural heritage assets along the cable route (Table 5.4). It has also been found that this adverse effect could be adequately mitigated by a programme of archaeological works, which would ensure that the residual effect of the proposed development would be neutral (Table 5.4). Therefore, no significant environmental effects would result from the excavation of the cable route.

### Vegetation & Terrestrial Fauna

**28.** This section considers the potential impacts of the proposed grid connection route on potential ecological receptors along the proposed route which include flora, fauna

and habitats. Desk records were identified from the NIEA Natural Environment Map Viewer and the National Biodiversity Network (NBN) Gateway online.

- **29.** The proposed grid connection route follows the wind farm access track from the substation to the Carrickayne Road (a distance of *c*.900m) and it is currently proposed to bury the cable along the existing public road network for *c*20.5km to link with the North Sperrins Scheme via underground cable.
- **30**. The proposed route was assessed as part of a desktop study in June 2024 to identify species and habitats likely to be found along the proposed grid connection route.

#### **Construction Phase**

- 31. Along the proposed grid connection route, a number of habitat features of ecological importance were identified mature tree cover (encompassing both woodland and mature trees present within roadside hedgerows/gardens), hedgerows, bridges (which can support roosting bats), peatlands and rivers.
- 32. As it is proposed to bury the cable under the road surface of under the road verge, adjacent peatland habitat is unlikely to be negatively impacted however the root zone of roadside hedgerows and mature tree cover may be negatively impacted. Tree roots will be avoided where possible by the use of British Standard BS5837: 2005 Trees in Relation to Construction Recommendations.
- **33**. The proposed grid connection route follows the existing road network over the entirety of its route from the North Sperrin Scheme to the entrance of the proposed wind farm development at Mullaghclogher. The majority of this route passes through a rural landscape dominated by improved and semi-improved agricultural grasslands with scattered rural dwellings and farmsteads; areas of woodland and bisecting river habitats being very localised along the route. Peatland habitats are present along the road margins of the Ballymacross Road, Aghafad Road and Carrickayne Road which all occur within *c*.6km of the entrance of the proposed windfarm.
- 34. Within the proposed wind farm site, the proposed grid connection will be laid along the proposed access track to the substation; this infrastructure passes primarily through wet modified bog and localised parcels of marshy grassland and marshy grassland/modified wet bog mosaic.
- 35. The cable will need to navigate two bridge structures along the proposed route outside of the proposed wind farm site, both of which pass over different sections of one European designated site; there is the potential for cable laying to impact negatively upon the bridge structures (which may support roosting bats) as well as the aquatic environment and designation features of the River Faughan and tributaries Special Area of Conservation (SAC) and Area of Special Scientific Interest (ASSI).
- 36. Below is a list of ecological habitat features which may be impacted by proposed cable laying (note that roadside tree cover is only mentioned where the crowns of such trees appear to overlap the entirety, or a significant proportion of, the road surface and/or where mature tree cover occurs along both road margins at the same

point; each of these scenarios would make it potentially difficult for the proposed cable laying to adhere to British Standard BS5835: Trees in relation to Construction - Recommendations):

- 37. Hedgerow will need to be removed or tunnelled beneath to install cable across fields from North Sperrin Scheme Substation to Ballyhanedin Road;
- 38. Cable installation beneath Ballyhanedin Road adjacent to Banagher Presbyterian Church may cause damage to roots of mature trees which line both margins of the road at this point;
- **39.** Cable installation beneath the Glenshane Road in the vicinity of its junction with Terrydreen Road and no.560a Glenshane Road may cause damage to roots of mature trees which primarily line the northern margin of the road at this point (a few also occur along the southern road margin);
- 40. Cable installation beneath the Glenshane Road in the vicinity of its junction with Altinure Road and Strand Gospel Hall may cause damage to roots of mature trees which primarily line the northern margin of the road at this point;
- 41. Cable installation beneath Longland Road a short distance to the south-west of its junction with Glenshane Road and Strand Gospel Hall may cause damage to roots of mature trees which primarily line the south-eastern margin of the road at this point;
- 42. Cable installation beneath Longland Road to the immediate north-east of the River Faughan may cause damage to mature roadside woodland cover which is present along both sides of the road at this point;
- 43. Cable installation will need to span the bridge along Longland Road which crosses over the River Faughan a short distance to the south-west of the Glenshane Road, which forms part of the River Faughan and Tributaries SAC and ASSI; appropriate mitigation measures will therefore be required to ensure that the aquatic environment, and the designation features of this designated site, is not impacted adversely;
- 44. Cable installation beneath the Longland Road approximately mid-way between Learmount Road and Slieveboy Road, where a cluster of rural dwellings are situated, may cause damage to roots of mature trees which primarily line the northern margin of the road at this point;
- 45. Cable installation will need to span the bridge along Longland Road which crosses over the River Faughan a short distance to the west of Slieveboy Road, which forms part of the River Faughan and Tributaries SAC and ASSI; appropriate mitigation measures will therefore be required to ensure that the aquatic environment, and the designation features of this designated site, is not impacted adversely;
- 46. Cable installation beneath Longland Road to the immediate west of the River Faughan SAC/ASSI may cause damage to mature roadside tree cover which is present along both sides of the road at this point;
- **47.** Cable installation beneath the Longland Road approximately mid-way between the River Faughan SAC/ASSI and Cumber Road, where farm buildings are situated to the south of the road, may cause damage to roots of mature trees which primarily line the southern margin of the road to the immediate west of the farm yard;

- **48**. Cable installation beneath the Longland Road a short distance to the east of its junction with Cumber Road, where a quarry is situated to the south of the road, may cause damage to roots of mature trees which line both margins of the road to the immediate north of the quarry;
- **49.** Cable installation beneath the Longland Road a short distance to the west-southwest of its junction with Cumber Road, where a private dwelling is situated to the south of the road, may cause damage to roots of mature trees which line both margins of the road to the immediate north of the quarry;
- **50.** Cable installation beneath the Aghafad Road a short distance to the north of its junction with Loughash Road, may cause damage to roots of mature trees which line both margins of the road at this point;
- 51. Cable installation beneath the Lisnaragh Road a short distance to the north of its junction with the Aghafad Road, may cause damage to roots of mature tree cover which form the northeastern limit of a small block of woodland present along the south-western margin of the road at this point; and
- **52.** Cable installation beneath the Lisnaragh Road from where the Burn Dennett River crosses beneath the road in the proximity of Tornoge Road, south-east to Carrickayne Road where the Stroanback Burn flows beneath the road, has the potential to negatively impact upon Aghabrack ASSI which is an area of peatland designated for its demonstration of glacial features and the presence of an area of raised bog.
- **53.** With regard to flora and fauna, an online search for biological records using the NBN Atlas for Northern Ireland found a total of 14,432 species records within a 10km radius of the centre-point of the proposed grid connection route; these are too numerous to detail individually but include the following species which have the potential to be negatively impacted by cable laying, primarily through habitat loss/fragmentation and/or disturbance: Whooper Swan, Otter and Atlantic Salmon.
- 54. Any trenching to lay an underground cable should involve immediate re-instatement of the low-quality habitats found in the roadside verges. Therefore, net habitat loss is anticipated to be neutral.
- 55. The direct potential impacts on faunal receptors are related mostly to habitat loss and disturbance of habitats as a result of activities to excavate a trench for an underground cable. In addition, there is the potential for direct disturbance to protected fauna from construction noise and associated activities themselves. Any trenching to lay an underground cable would involve immediate reinstatement of the habitats. Therefore, net habitat loss is anticipated to be neutral.
- 56. The online biological records search also found records for two invasive non-native plant species which occur in close proximity to the proposed cable laying route: Japanese Knotweed and Himalayan Knotweed. There is the potential for the proposed cale laying works to spread these species across the wider landscape.
- **57.** On the basis of the findings of this desk study, the significance of the potential impacts is assessed to be low-minor, however pre-construction mitigation measures that should be adopted by the construction contractor are proposed below:

- Pre-construction surveys to identify areas of sensitive habitat which should be avoided;
- Pre-construction protected species to identify species or features supporting species along the route and allow the preparation of appropriate mitigation;
- Pre-construction invasive non-native species to identify species or features supporting these injurious species along the route and allow the preparation of appropriate mitigation;
- Preparation of a construction method statement for the grid connection stating how impacts on protected species and habitats would be avoided;
- The use of an ECoW (Ecological Clerk of Works) during construction to ensure that all of the above measure is properly implemented;
- Tree roots will be protected by the implementation of BS5837:2005, where excavations will not be permitted inside the RPA (Root Protection Area) which are;
  - $\circ~$  12 times the diameter of the trunk measured at 1.5 m for a single stemmed tree; or
  - 10 times the diameter of the tree measured immediately above the root flare for a multi-stemmed tree;
- No spoil, vehicles, fuel, materials, temporary buildings or ancillary equipment shall be stored inside the RPA. Existing ground levels within the RPA should not be raised or lowered; and
- It is not possible at this stage to completely rule out the need to remove small sections of hedgerow or trees but if this was required, these will be re-planted or replaced.
- 58. Completion of a programme of ecological mitigation works would offset the loss of the ecological resource that would occur as a result of the construction of the grid connection. Taking the proposed mitigation into account, no significant residual effects are anticipated to occur.

#### Operational Phase

No operational impacts from normal operation of an underground connection are predicted. Should excavation be required for maintenance purposes, this would result in habitat disturbance but this should be re-instated following works.

## Ornithology

**59**. The underground cable is to run within the road side verges adjoining the carriageway or within the carriageway itself therefore it is highly unlikely that either the construction or operation of the cable route would have any significant adverse effects on birds either directly (due to loss of habitat or disturbance of active nests) or indirectly (due to displacement effects).

## Geology and the Water Environment

60. Potential direct effects of the proposed grid connection route options are on water quality, morphology, water resource and flood risk to surface and groundwater in the affected sub-catchments. Potential indirect effects on water dependent habitats are addressed separately within the ecology section.

#### Geology & Hydrogeology

- 61. The potential grid connection route begins at the wind farm substation within the proposed development site boundary and would follow site tracks north towards the site entrance, from where it would then follow the public road corridor beginning at Carrickayne Road.
- 62. The grid connection route comes within 650 m of the Aughafad limestone quarry on Lisnaragh Road and within 320 m of an unnamed (presumed) sand and gravel extraction site on Tornoge Road. On Longland Road it passes adjacent to Lisbunny limestone quarry.
- 63. The route travels through a variety of superficial geology including areas of unlithified peat deposits, till diamicton (typically boulder clay), pockets of glaciofluvial sheet deposits (sand and gravel), and alluvium (clay, silt, sand and gravel).
- The entirety of the grid connection route lies within the Claudy groundwater body (UKGBNI4NW003). The Claudy groundwater body has a Water Framework Directive (WFD) water quality status of 'Good'.
- The aquifers underlying the route have uniform characteristics and are indicated by GSNI mapping as having limited potential productivity with fracture flow. GSNI mapping indicates the presence of potential<sup>1</sup> superficial aquifers along the route.

<sup>&</sup>lt;sup>1</sup> GSNI state that 'A regional, detailed assessment of the individual deposits in terms of their aquifer potential (aerial extent, thickness, saturated depth etc.) has not yet been undertaken. Hence formal classification of each deposit as an aquifer area is not possible at present.' (https://mapapps2.bgs.ac.uk/GSNI\_Geoindex/LayerHelp/superficials\_aquifer.htm)

- GSNI groundwater vulnerability is categorised from Highest (5) to Lowest (1). On the vulnerability scale, Class 4 can be further subdivided according to the nature of the underlying geology. Mapping along the grid connection route indicates vulnerability ratings of 4a (sand and gravel cover (non-aquifer)), 4c (low permeability cover), and 4e (where superficial aquifers are present).
- Given trench excavation will be shallow (i.e., 1.0 m deep and could run in the roadside verges), they are unlikely to adversely impact groundwater and / or potential superficial aquifers. However, good practice guidance on pollution prevention (as outlined in Appendix 9.1) should be adhered to during works across the proposed route, with particular focus on areas identified as vulnerable where potential superficial aquifers may be located.
- Consultation with statutory stakeholders regarding private water supplies (PWS) and review of Drinking Water Inspectorate (DWI) online mapping was undertaken during the preparation of the Environmental Statement for the Development. No PWS have been identified in proximity to the proposed grid connection route.
- Review of NIEA data indicates 1 no. non-PWS groundwater abstraction in the vicinity (250 m) of the proposed connection route. The abstraction is a groundwater abstraction (from quarry sump) located at the Lisbunny limestone quarry.
- It is not anticipated that PWS and non-PWS will be affected by cable laying as the works will be confined to the road corridors and laying the cable at a shallow depth will avoid impacting groundwater quality / flow. However, the location of the water supplies should be confirmed prior to commencement on site and where appropriate, buffer zones established and maintained for the duration of the works.

#### Hydrology

- 64. Proposed grid route crosses several surface water catchments (refer to Appendix 2.1 Table 1 below). NIEA catchment data indicates that the initial 9.8 km of the route from the site entrance location is within the upper reaches of the River Foyle catchment while the remaining 10.6 km is located within the River Faughan catchment. Therefore, it is hydrologically connected to the River Foyle and Tributaries SAC / ASSI and the River Faughan and Tributaries SAC / ASSI designated for habitats and / species which are rare or threatened within a European context.
- **65**. The qualifying features of these designated sites may be sensitive to potential changes in flow regimes or introduction of potential pollutants as a result of works associated with the proposed development. Details are outlined in the table below.

Catchment	Approx. cable length (km)	Approx. % of overall proposed cable route	NIEA WFD Status (2021)	Local Management Area	Catchment Stakeholder Group	River Basin District	Associated Protected Areas
Burn Dennett River (Ballynamallaght)	4.5	22	Good	Burn Dennet and Foyle	Lower Foyle	North Western	River Foyle and Tributaries SAC / ASSI; Silverbrook Wood ASSI; Corblyin Wood ASSI
Altinaghrea Burn	5.3	26	Good	Burn Dennet and Foyle	Lower Foyle	North Western	River Foyle and Tributaries SAC / ASSI; Corblyin Wood ASSI
Glenrandal River	4.3	21	Good	Faughan	Lower Foyle	North Western	River Faughan and Tributaries SAC / ASSI
River Faughan (Park)	6.3	31	Good	Faughan	Lower Foyle	North Western	River Faughan and Tributaries SAC / ASSI

#### Technical Appendix 1.4 Table 1: Summary of Catchments along Proposed Cable Route

- 67. No surface water non-PWS abstractions are located in the vicinity (250 m) of the proposed grid connection route.
- **68**. Construction works associated with the proposed development (underground cable to a depth of 1.0 m) will follow the route of existing road corridors and cross watercourses via existing bridges and culverts. The cable routes affect no significant fluvial floodplains other than those contiguous with existing road bridges and culverts. The cable route will not further encroach into existing floodplains compared to existing conditions.
- **69**. Similarly, during the operational phase of the Development, the cable route would by its nature (buried) have no effect on flooding by causing restrictions or disruption to flood flows.
- **70.** While risk of flooding given the nature of the proposal is not deemed significant, the Applicant will take a precautionary approach and adopt appropriate measures to avoid earthworks becoming inundated and potentially transporting sediment off-site into the water environment. Measures may include, but not be limited to:
- Routinely checking weather warnings and planning for adverse weather conditions;
- Storing plant and materials in areas outside areas prone to flooding;
- Implementing temporary drainage systems to alleviate localised surface water flood risk and prevent surface water ingress to the construction working areas; and
- Prevent obstruction of existing surface runoff pathways.

- 71. The nature of the proposed development (underground cable) and the methods used to cross watercourses (i.e., within existing bridge decks or by directional drilling) would have no potential to affect watercourse morphology, and so potential for effects at watercourse crossings are not considered further.
- 72. Other effects associated with typical construction activities would be similar to those described in Chapter 9: Geology and Water Environment and would be solely associated with the construction phase. No operational effects are anticipated.
- 73. The following table summarises the potential surface and ground water constraints to development of the grid connection, as well as likely potential effects.

#### Noise

- 74. During the construction phase, noise generating plant would be used and it is likely that noise levels would temporarily increase at residential properties within the vicinity of the construction works along the grid connection route.
- 75. Construction activities with the potential to generate noise from the grid connection construction are likely to include clearance of land, digging of trenches and backfilling of trenches and remediation.
- 76. In Northern Ireland, advice on construction noise assessment is referred to in The Control of Noise (Codes of Practice for Construction and Open Sites) Order (Northern Ireland) 2002<sup>2</sup>. This legislation advises the use of British Standard BS 5228: Part 1:1997 as being suitable for giving guidance on appropriate methods for minimising noise from construction and open sites in Northern Ireland.
- 77. Since the 1997 version has been superseded by British Standard BS 5228-1:2009 'Code of practice for noise and vibration control on construction and open sites Part 1: Noise'<sup>3</sup> this has been identified as being suitable for the purpose of giving guidance on appropriate methods for minimising noise from construction activities.
- **78.** The ABC method described in Annex E of BS 5228-1:2009 sets threshold noise levels for specific periods based on the ambient noise level. Category A would be deemed appropriate due to the relatively low levels of ambient noise along the proposed route. This category sets minimum  $L_{Aeq}$  criteria of: 65 dB(A) during weekdays (07:00-19:00) and Saturdays (07:00-13:00); below 55 dB(A) at evenings and Saturdays (13:00-23:00); and below 45 dB(A) for night-time (23:00-07:00) periods.
- **79.** Noise levels due to the construction of the grid connection route will be mitigated by the short-term nature of the activity. Furthermore, the following noise mitigation options will be implemented where appropriate:
- **80.** Consideration will be given to noise emissions when selecting plant and equipment to be used;
- 81. All equipment to be maintained in good working order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable;
- 82. Stationary noise sources will be sited as far away as reasonably possible from residential properties;
- **&3.** The movement of vehicles to and from the grid connection route will be controlled and employees instructed to ensure compliance with the noise control measures adopted; and,
- **84.** Site construction operations should be limited to specific time periods except during periods of emergency work.

<sup>&</sup>lt;sup>2</sup> 'The Control of Noise (Codes of Practice for Construction and Open Sites) Order (Northern Ireland) 2002', The Department of the Environment, November 2002

<sup>&</sup>lt;sup>3</sup> 'Code of Practice for Noise and vibration control on construction and open sites - Part 1: Noise', British Standards Institution, BS 5228-1:2009

- 85. If planning permission is granted, planning conditions can be proposed so that appropriate noise mitigation measures and construction practices are included within a Construction Environmental Management Plan (CEMP).
- **36.** There are many strategies to reduce construction noise and any mitigation adopted should not be limited to the measures suggested.
- 87. The Pollution Control and Local Government (NI) Order 1978 provides information on the need for ensuring that best practicable means are employed to minimise noise<sup>4</sup>. For all activities, measures will be taken to reduce noise levels with due regard to practicality and cost.
- 88. With appropriate mitigation, if required, it is assessed that there will be no residual significant effects during the construction phase.
- 89. There are no anticipated effects during the operational phase.

### Traffic and transport

- **90.** All grid connection construction works should be undertaken in accordance with a Construction Method Statement and any associated road opening licences, agreements or permits. A Traffic Management Plan including details of any temporary road closures should be agreed with Transport NI prior to the commencement of works. The Traffic Management Plan should be developed to ensure any disruption during the underground cable works will be kept to a minimum. However, it is likely that there will be temporary, local traffic disruptions for the duration of the underground cable installation works.
- 91. It is expected that there will be some disruption to traffic flows along the carriageways flanking the proposed grid route that will be managed but some narrower routes (i.e. bridge crossings) may require temporary road closures.
- 92. No significant residual effects are anticipated to occur.
- **93.** When installed, the underground cable will have no adverse effect upon traffic during the operational phase.

<sup>&</sup>lt;sup>4</sup> 'Pollution Control and Local Government (NI) Order 1978', published by Her Majesty's Stationary Office, 1978

# Summary

**94. Technical Appendix 1.4 - Table 3** provides a summary of the potential environmental effects and proposed mitigation.

Торіс	Potential Construction Impacts	Potential Operational Impacts	Mitigation	Residual Effects
Landscape & Visual	Loss of landscape character and visual amenity	None	Avoidance of removal or root disturbance of mature trees, in particular, healthy ash trees which may not be able to be replaced; disturbance to tree routes should be avoided during the burial of the cable.	No significant impacts
Archaeology & Cultural Heritage	Negligible direct impacts possible by the disturbance of unknown remains	None	The minor impacts resulting to any buried archaeological remains present under the roadway, or roadside along the cable route could be adequately compensated for by a programme of archaeological monitoring and recording during the excavation works along the route.	Following mitigation, no significant residual impacts are predicted
Vegetation & Terrestrial Fauna	Potential disturbance or loss to habitat, within a range of habitat classifications	None	Pre-construction surveys to identify areas of sensitive habitat which should be avoided; Pre-construction protected species to identify species or features supporting species along the route and allow the preparation of appropriate mitigation; Pre-construction invasive non-native species to identify species or features supporting these injurious species along the route and allow the preparation of appropriate mitigation;	Completion of a programme of ecological mitigation works would offset the loss of the ecological resource that would occur as a result of the construction of the grid connection. Taking the proposed

Торіс	Potential Construction Impacts	Potential Operational Impacts	Mitigation	Residual Effects
			Preparation of a construction method statement for the grid connection stating how impacts on protected species and habitats would be avoided;	mitigation into account, no significant residual effects are anticipated to occur.
			The use of an ECoW (Ecological Clerk of Works) during construction to ensure that all of the above measure is properly implemented;	
			Tree roots will be protected by the implementation of BS5837:2005, where excavations will not be permitted inside the RPA (Root Protection Area) which are;	
			<ul> <li>12 times the diameter of the trunk measured at 1.5 m for a single stemmed tree; or</li> </ul>	
			<ul> <li>10 times the diameter of the tree measured immediately above the root flare for a multi- stemmed tree;</li> </ul>	
			No spoil, vehicles, fuel, materials, temporary buildings or ancillary equipment shall be stored inside the RPA. Existing ground levels within the RPA should not be raised or lowered; and	
			It is not possible at this stage to completely rule out the need to remove small sections of hedgerow or trees but if this was required, these will be re- planted or replaced.	

Торіс	Potential Construction Impacts	Potential Operational Impacts	Mitigation	Residual Effects
Ornithology	None	None	None	No significant impacts
Geology & Water Environment	Reduced ground water quality: Limited potential for short term slight deteriorations in water quality due to excavations that would release sediments, due to changes in flow regimes or introduction of potential pollutants as a result of works associated with the proposed development	None	Buried cable would have no restrictions or disruptions to flood flows Routine checks on weather warnings and planning for adverse weather conditions Storing plant and materials in areas outside areas prone to flooding Implementing temporary drainage systems to alleviate localised surface water flood risk and prevent surface water ingress to the construction working areas Prevent obstruction of existing surface runoff pathways	No significant impacts
Noise	Potential release of noise emissions during construction phase	None	Consideration will be given to noise emissions when selecting plant and equipment to be used; All equipment to be maintained in good working order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable; Stationary noise sources will be sited as far away as reasonably possible from residential properties; The movement of vehicles to and from the grid	No significant effects

Торіс	Potential Construction Impacts	Potential Operational Impacts	Mitigation	Residual Effects
			connection route will be controlled and employees instructed to ensure compliance with the noise control measures adopted; Site construction operations should be limited to specific time periods except during periods of emergency work.	
Transport and Traffic	Temporary traffic disruption during the cable laying, and some temporary road closures	None	All grid connection construction works should be undertaken in accordance with a Construction Method Statement and any associated road opening licences, agreements or permits.	No significant impacts

## Appendix A: Figure Appendix 1: Potential Grid Connection



## Appendix B: Heritage Assets Reviewed in Potential Grid Connection Assessment

# Appendix B - Heritage Assets reviewed as part of baseline appraisal for cable route assessment.

**Listed Buildings** 

Historic Building Reference	Grade	Address	Grid Reference
HB01/01/003A	A	Banagher Presbyterian Church,	C2610 4057
		Glenshane Road,	
		Claudy,	
		Co. Londonderry	
HB01/01/003B	В	Banagher Manse,	C6082 0597
		Ballyhanedin Road,	
		Ballyhanedin,	
		Feeny,	
		Co Londonderry,	
		BT47	
HB01/01/018	В	Ling House,	C5458 0438
		173 Slieveboy Road,	
		Ling,	
		Claudy,	
		Co Londonderry,	
		B47 4AS	
HB01/02/030	В	Glenalla House,	C5405 0514
		Lower Alla,	
		Claudy,	
		Co. Londonderry	
HB10/09/006	В	St Marys RC Church,	H4950 9837
		Aghabrack,	
		Lisnaragh Road,	
		Donemana,	
		Strabane,	
		Co Tyrone,	
		BT82 OSD	
HB01/01/023	В	Millbrook Mill,	C5695 0586
		350 Longland Road,	
		Killycor,	
		Claudy,	
		Co Londonderry,	
		BT47 4AJ	

#### Scheduled Monuments

COUNTY	SM NO	TOWNLAND	Description
LDY	030:010	Terrydreen	Standing Stone
LDY	029:018	Clagan	Standing Stone
LDY	029:011	Lisbunny	Rath
TYR	006:004	Balix Lower	Cashel

Industrial Heritage

Industrial	Description	LOCATION	GRID REF
Heritage			
Reference			
01950:000:00	Bridge	Ballyhanedin / Feeny	C61900549
01949:000:00	Bridge	Straid/Tirglassen	C59480576
01939:000:00	Corn and Flax Mill Site	Tirglassen	C59260555
01934:000:00	Limekiln on edge of Quarry	Killycor	C57710628
01935:000:00	Thrasing Machine	Killycor	C57710604
01936:000:00	Bridge	Clagan/Killycor	C57850612
01937:000:00	Tannery – Tan Yard and Corn	Clagan	C57920605
	Mill Site		
01948:000:00	Old Mill	Killycor	C57750596

#### Archaeological Remains

SMR No	Feature Description	Period	Grid Reference
LDY 030:009	Standing Stone	Prehistoric	C6036005550
LDY 030:049	Cist Cemetery of 4 Cists	Prehistoric,	C5959005830
		Bronze Age	
LDY 029:036	Burial Ground (O.S. memoir site, unlocated)	Uncertain	C590006000
LDY 030:051	A.P. Site - circular cropmark	Uncertain	C5981006270
LDY 029:024	Enclosure	Uncertain	C5797006040
LDY 029:052	Historic Settlement Straidarren	Post-Medieval	C 57603 06180
LDY 029:023	Natural Feature	Uncertain	C5706005550
LDY 029:009	Standing Stone	Prehistoric	C5648005240
LDY 029:010	Enclosure	Uncertain	C5456005030
LDY 029:053	Historic Settlement Tullintrain	Post-Medieval	C 55517 04898
LDY 029:041	Megalithic Tomb (O.S. memoir site,	Prehistoric	C5400004000
	unlocated)	Neolithic	
LDY 029:028	Natural Feature	Uncertain	C5257004220
LDY029:029	Mound	Uncertain	C5214004040
TYR 003:001	Standing Stone	Prehistoric	C5131003840
TYR 003:002	Rath	Early Christian	C5075003890
TYR 003:013	Cairn and Standing Stone: Leabaidh NA	Prehistoric	C5050002190
	Bhfathach or Leabaidh NA Bpeacadh		
TYR 006:033	Cist Burial	Prehistoric,	C5030001900
		Bronze Age	
TYR 006:023	Rath	Early Christian	H4843098760
TYR 006:038	Cairns	Prehistoric	H4910098700