2

PLANNING POLICY

Appendix 2.1

Introduction

The Consenting Context

2.1. 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 is sought either from the relevant owner of the local distribution or transmission network, in this case Northern Ireland Electricity Ltd.

2.2. The Best Practice Guidance to PPS 18 states that whilst the routing of such lines by NIE 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.

2.3. Any Environmental Impact Assessment should assess the complete project, rather than a portion thereof and this is the purpose of this Appendix.

2.4. This chapter contains the following:

- Appendix A - Figure 1 is referenced in the text as appropriate.
- Appendix B – Heritage assets reviewed as part grid route assessment

Potential Grid Connection

2.5. 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 published plans for future upgrades, RES has been able to undertake an assessment to determine the grid connection option, most likely favoured by NIE, which is proposed either to Kells or Ballymena Substation.

2.6. The Development would be connected by approximately 28 km of underground cable to Kells Substation or 28 km of underground cable to Ballymena Substation.

2.7. The proposed grid connection route to Ballymena Substation follows the Carnlough road (A42), before continuing onto the Raceview road. The route then continutes from the Raceview road onto the Knockan Road, before turning onto the Ballygarvey road. The route then crosses over to the Cushendall road, then Queens street, and finally the Toome road. The substation is accessed via the Toome Road.

2.8. The proposed grid connection to the Kells substation follows the Carnlough road, before crossing onto the Hazelbank road, then The Cuttings road. The rout continues to the end of The Cuttings, before crossing onto the Caranalbanagh Road, then the Racavan Road. At the end of the Racavan road, the route crosses onto the Rathkeel road, and then the Moorefields Road. Finally, the route continues via Speerstown Road, and then onto Maxwells Road. The substation is located on Maxwells Road.

2.9. The route would begin at the connection point within the Development, and thereafter would follow the public road corridor from the wind farm site entrance to the indicative cluster location, as shown in Appendix 2.1 (Appendix A) Figure 1: Potential Grid Connection.

2.10. For an underground cable connection, the trench would be similar to those used on the main Development site, as shown in Volume 3 Figure 2.15. The trench will be approximately 0.5 m – 0.75 m wide and 1.0 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. At 33 kV, underground cables are normally laid to a depth of 0.9 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.

2.11. 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.

2.12. The construction activities would include the following:

- Clearance of land (including vegetation strip as appropriate)
- Digging of trenches
- Backfilling of trenches and remediation.

2.13. The land should be reinstated as near as reasonably practicable to its original condition.

2.14. It is anticipated that the works would be implemented by NIE using its permitted development rights as a statutory undertaker.

Potential Impacts

2.15. 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
- Ecology
- Ornithology
- Geology and the water environment
- Fisheries
- Cultural heritage and archaeology
- Noise

- Traffic and transport.

Landscape and Visual

2.16. Both route options are approximately the same length and initially follow the Slane Road corridor from a newly formed site entrance on the A42 near Doonan Leap to the junction with the A42 at the south western end of Slane Road. The site entrance would include the removal of a small bank of existing trees adjacent to the A42 which would also create adequate space for the grid cable route without further removal of vegetation being required. The site entrance works include proposals to plant a new belt of mixed woodland on the southern side of the site access track which will mitigate the loss of this relatively small area of trees.

2.17. The middle section of Slane Road is relatively open with an absence of trees or hedgerows. Landscape or visual disturbance resulting from the installation of underground cables would be negligible. Roadside field boundaries are either defined by grass verges and embankments with post and wire fences or rough grass verges formed over low dry stone embankments. The latter are a more valuable feature of landscape character within the AONB and the cable route would be planned to minimise their loss. If removal is required these stone walls would be re-formed using the same stone.

2.18. The north eastern and south western sections of Slane Road are, however, characterised by hedgerows and trees, mostly Ash. These often contain the road corridor without any verges and would therefore require removal if cable trenches were not installed beneath the road service. The latter is preferable in order to retain this roadside vegetation, both for its contribution to the physical character of these parts of Slane Road and also its screening function, restricting or filtering views of the Development from the road, some adjoining residential properties and the tourist parking area at Doonan Leap. If replacement planting were required it would not be possible to replace Ash species due to potential risks from Ash Dieback disease and removal of existing healthy Ash trees would also be avoided where possible for this reason.

2.19. The remainder of the Ballymena substation route follows the A42. This is a wider road corridor, frequently bounded by grass verges and, in proximity to residential properties and settlements, footpaths which would provide sufficient space for the installation of cable trenches without disturbance to adjacent hedgerows. Hedgerows (primarily hawthorn) are, however, usually low in height. Therefore, sections that may require removal could be successfully replaced with negligible landscape or visual effects. Along many parts of the A42 there is a general absence of mature trees and those that remain have value for their scarcity. These usually occur in proximity to residential driveways around the townlands of Little Skerry, Lisles Hill and The Sheddings. The cable route would avoid these trees wherever possible. Disturbance to tree roots would also be avoided through the careful

selection of the cable route and the mitigation measures outlined in Table 2.1 would be employed where relevant.

2.20. The Kells route also follows the A42 until the Sheddings as described above. It then diverges onto the tertiary road network through the pastoral lowlands around the base of Slemish. The majority of this road network is narrower and heavily vegetated. Mature stands of trees and hedges occur frequently and define many parts of the road corridor without grass verges. Disturbance of these areas of vegetation, particularly where mature trees are present, would be avoided through the excavation of cable trenches within the road corridor where possible. Where disturbance of roadside vegetation is required the mitigation measures outlined in Table 2.1 would be implemented. Hedgerows and trees would be replanted with the same species where possible. However, Ash trees would be replaced by Beech, which is also common in this landscape. The road corridor is more open and sparsely vegetated on higher ground around Racavan Hill, Black Top and along the A36 section of the route to the west of Moorfields village. Along these sections of the Kells route there is likely to be sufficient space within roadside verges to install cables with negligible effects on landscape or visual character.

Ecology

Habitats

2.21. This section considers the potential impacts of the proposed grid connection on the flora & fauna interests along the proposed route. Desk records were identified from the NIEA Environment Map Viewer and the NBN (National Biodiversity Network) Gateway. The route follows the wind farm access track from the substation to the public road (approx. 1800 m) and it is currently proposed to bury the cable under the public road for approximately 28 km of underground cable to Ballymena Substation or 28 km of underground cable to Kells Substation.

2.22. The proposed route southwards to either substation lies alongside the road network for almost its entire length. The proposed route was assessed as part of a desktop study in January 2022. These methods were aimed at identifying the habitats and species found or likely to be found along the proposed grid connection route.

2.23. Within the wind farm Site, the proposed grid connection follows the route of the proposed access track which lies within a mosaic of marshy grassland/blanket bog/wet heath and improved grassland. Between the Site entrance and the substation, the proposed grid connection option would be buried in the carriageway, (or in the roadside verge) which primarily consists of rank semi-improved grassland with occasional trees/scrub. The wider landscape is a mix of improved/semi-improved agricultural grassland.

2.24. Mature trees, hedgerows and river crossings are the areas of conservation value along the proposed grid connection route. However, it is proposed to bury the cable in the roadside verge, away from these habitats of conservation value. Tree roots will be

avoided by the use of British Standard BS5837: 2005 Trees in relation to Construction - Recommendations.

Fauna

2.25. Given the length of the proposed grid connection there are several thousand species records on the National Biodiversity Network (NBN) records within a 10 km radius of the centre point of the two individual route corridors. There are too many records to address individually, especially given that the route lies primarily within the curtilage of the public road. However, pine marten, red squirrel, bats, badger, hedgehog, smooth newt and common lizard are all considered to be likely to occur in the area (at least in certain foci) between the wind farm entrance and either of the two alternative substations.

2.26. The direct potential impacts on important ecological receptors are related mostly to any potential habitat loss and disturbance of habitats as a result of activities to excavate a trench for an underground cable. Any trenching to lay an underground cable should involve immediate reinstatement of the low-quality habitats found in the roadside verges. Therefore, the net habitat loss should be neutral.

2.27. 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, the net habitat loss would be neutral.

2.28. Disturbance of habitats along the route also has the potential to result in indirect impacts on faunal species which inhabit those habitats and this could include, pine marten, red squirrel, bat species, smooth newt, badger and common lizard all of which have been recorded along or in close proximity to the route.

2.29. No operational impacts from normal operation of an underground connection are predicted. Should the cable be required to be excavated for maintenance this would result in habitat disturbance but this should be reinstated following works.

2.30. On the basis of the desk study undertaken the significance of the potential impacts is assessed to be low-negligible, 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;
- Preparation of a construction method statement for the grid connection stating how impacts on protected species and habitats would be avoided; and
- 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;
    - 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.
- 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 should be replanted or replaced.

2.31. 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.

Ornithology

2.32. 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). Neither of the two possible likely options for the route passes through a sensitive bird area and the construction and operation would in any case be confined within the road carriageway and verges.

Geology and the water environment

2.33. 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 published plans for future upgrades, RES has been able to undertake an assessment to determine the grid connection option, most likely favoured by NIE, which is proposed either to Kells or Ballymena Substation.

2.34. 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

2.35. Both Route 1 and Route 2 would begin at the connection point within the Development, and thereafter would follow the public road corridor beginning on Carnlough Road (A42).

2.36. The existing site entrance from Carnlough Road, is in proximity (c. 20 m) of the historic mine working associated with Cullinane Mine.

Hydrogeology

2.37. Both Route 1 and Route 2 begin within the site boundary, located upon the Glenariff groundwater body. Both routes follow the similar path to the point where they cross into the Ballymena groundwater body on Slane Road, approximately 2.2 km south-west of the site entrance location.

2.38. The Glenariff groundwater body has a Water Framework Directive (WFD) water quality status of 'Good'. The Ballymena groundwater body has a water quality status of 'Poor'.

2.39. The majority of both proposed routes travels through areas of diamicton till (typically boulder clay). The Ballymena route traverses pockets of glaciofluvial sheet deposits (sand and gravel), and alluvium (clay, silt, sand and gravel) as it passes through Broughshane. Between Broughshane and Ballymena the route passes though predominantly morainic deposits (silt, sand, gravel and bounders) as it travels west before turning south towards Ballymena where again diamicton till is prevalent.

2.40. From the point where the two routes diverge, the Kells route turns south where diamicton till continues to be the dominant superficial deposit in this area. Disctere pockets of peat are mapped in the vicinity of Racavan Road approximately 7 km south of the point of divergence of the two routes.

2.41. The aquifers underlying the route are largely uniform in nature; GSNI mapping indicates moderate productivity and fracture flow across the wider region along both routes. GSNI mapping indicates the presence of potential1 superficial aquifers along the Ballymena route where it is in proximity to Braid River.

2.42. Groundwater vulnerability is categorised from Highest (5) to Lowest (1) and is variable along the length of the proposed connection route:

- From the site entrance point to the location where the routes diverge the groundwater underlying this area is noted as having a vulnerability Class 5.
- From this point, the Ballymena route traverses areas of Class 4c (low permeability cover) and Class 5 until it nears Braid River. Along the section in proximity to the river, the vulnerability it noted as Class 4e until the western edge of Broughshane. This coincides with the potential superficial aquifers mapped along this reach and the underlying glaciofluvial sheet deposits and alluvium. Beyond this section and into Ballymena, the route passes over areas noted as vulnerability Classes 2 and 4e, again coinciding with larger watercourses (tributaries of Braid River).

[1] 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)

- The Kells route travels south from the divergence point and passes through an area where the groundwater vulnerability is predominantly noted as Class 2. One small section (c. 200 m) passes through a section Class 4e. This is associated with potential superficial aquifers around Kells Water.

2.43. 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.

2.44. 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. One PWS (ref: MA035) has been identified in proximity to the proposed grid connection routes at a property on Hazelbank Road (near the junction with Carnlough Road and Lisles Hill Road), approximately 2.3 km south-west from the survey boundary.

2.45. Several non-PWS groundwater abstractions are in the vicinity (250 m) of the proposed Ballymena connection route. These include:

- 1 no. licence (4 no. locations on site) near Railway Street, Ballymena (AIL\2008\0156) - Food & Drink; and
- 1 no. near King George Park, Ballymena (AIL\2010\0028) – Industrial.

2.46. None were found to be located in proximity to the proposed Kells connection route.

2.47. 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

2.48. Proposed grid routes cross several surface water catchments (Ballymena Route crosses seven, as does the Kells Route (refer to Appendix 2.1 Table 1 below)). Although the catchments are not the same in each case, all ultimately discharge to River Main and thereafter Lough Neagh. NIEA catchment data indicates that the initial 2.2 km of both routes from the site entrance location are within the Glens and Rathlin Local Management Area (LMA). The remainder of both routes are located within the Braid and Main LMA.

2.49. As both cable laying routes have sections located in the upper reaches of Braid River, the upper catchment is hydrologically connected to downstream designated site. This includes including Farr's Bay (part of Rea's Wood and Farr's Bay SAC) designated due to the presence of habitat types and/or species which are rare or threatened

within a European context, and Lough Neagh ASSI / Lough Neagh & Lough Beg Ramsar site designated for its physical, chemical and biological characteristics.

2.50. Therefore, 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.

Appendix 2.1 Table 1: Summary of Catchments along Proposed Cable Route

Catchment	Approx. cable length (km)		Approx. % of overall proposed cable route		NIEA WFD status (2018)	Local Management Area	Catchment Stakeholder Group	River Basin District	Associated Protected Areas
Glencloy River	Ballymena & Kells Routes		Ballymena Route	Kells Route	Good	Glens and Rathlin	Bush & Glens	North-Eastern	N/A
	4 km		16%	15%					
Braid River (Aghacully)	Ballymena Route	Kells Route	Ballymena Route	Kells Route	Good	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	5.5 km	6.8 km	21.5% 22	25%					
Priest's Burn	Ballymena Route		Ballymena Route	Kells Route	Good	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	1.5 km		5.8% 6	N/A					
Glen Burn	Kells Route		Ballymena Route	Kells Route	Good	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	1.3 km		N/A	5.5%					
Braid River (Brough shane)	Ballymena Route	Kells Route	Ballymena Route	Kells Route	Good	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	5.4 km	3.8 km	21.1% 21.6 22	13.9% 14					
Braid River (Rabbit Hill)	Ballymena Route		Ballymena Route	Kells Route	Good	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	4.7 km		18.8%	N/A					
Braid River (Ballymena)	Ballymena Route		Ballymena Route	Kells Route	MEP	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	3.2 km		12.6% 12.8 13	N/A					
Deerfin Burn	Ballymena Route		Ballymena Route	Kells Route	Moderate	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	0.7 km		2.7% 2.8	N/A					
Devenagh Burn	Kells Route		Ballymena Route	Kells Route	Moderate	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	0.8 km		N/A	2.9% 3					
Kells Water (Moorfileds)	Kells Route		Ballymena Route	Kells Route	Good	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI

Catchment	Approx. cable length (km)	Approx. % of overall proposed cable route		NIEA WFD status (2018)	Local Management Area	Catchment Stakeholder Group	River Basin District	Associated Protected Areas
	8.7 km	N/A	32%					/ Lough Neagh & Lough Beg
Kells Water (Kells)	Kells Route	Ballymena Route	Kells Route	Moderate	Braid and Main	Lower Neagh Bann	Neagh Bann	Lough Neagh ASSI / Lough Neagh & Lough Beg
	1.5 km	N/A	5.5%					

2.51. Two surface water non-PWS groundwater abstractions are located in the vicinity (250 m) of the proposed Ballymena connection route:

- 2 no. on Braid River near Carnlough Road (AIL\2011\0017 and AIL\2011\0023) – Hydro Power

2.52. It is not anticipated the surface water non-PWS will be affected by cable laying as the works will be confined to the road corridors, will not require new watercourse crossings (utilising existing bridges and culverts), avoiding impacting surface water quality/ flow.

2.53. 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.

2.54. 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.

2.55. 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.

2.56. 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.

2.57. 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.

2.58. The following table summarises the potential surface and ground water constraints to development of the grid connection, as well as likely potential effects.

Appendix 2.1 Table 2: Summary of Geology and Water Constraints and Effects

Baseline Characteristic / Summary Description		Receptor	Unmitigated Potential Effect	
Groundwater	Aquifers with moderate productivity and local flow.	Abstractions / Private Water Supplies in proximity to the proposed cable route.	Reduced Groundwater Quality	Limited potential for short term slight deteriorations in water quality due to excavations that would release sediments; use of mechanical plant with associated fuels and lubricants.
			Reduced Groundwater Quantity	Shallow excavations associated with cable laying would not be anticipated to cause any change in groundwater flow routes.
Surface Water	Waterbodies with current WFD status of "Moderate / MEP" to "Good".	Water feature crossings and works in proximity to water features.	Reduced water quality	All watercourse crossings coincide with existing road crossings and culverts; the cable will be laid within the road deck over the existing culvert, or via directional drilling under the watercourse. Methods will not cause requirement for any in-stream work or work that would directly affect watercourse morphology or cause potential for pollution of the watercourse.
			Changes to watercourse morphology	
Surface Water	Floodplains	Route in proximity to discrete areas of fluvial and surface water floodplain.	Flood Risk to the development	The cable route would by its nature (buried) be unaffected by flooding. Appropriate techniques to manage surface water around working areas would be implemented.
			Increased flood risk elsewhere	The cable route would by its nature (buried) have no effect on flooding by causing restrictions or disruption to flood flows.
Protected Areas	Waterbodies protected for species	Route in upper reaches of the Braid River / River Main	Reduced water quality	All watercourse crossings coincide with existing road crossings and culverts; the cable will be laid within

Baseline Characteristic / Summary Description		Receptor	Unmitigated Potential Effect	
		catchment which is hydrologically connected to downstream protected areas designated for their flora, fauna, and / or geological features.	Changes to watercourse morphology	the road deck over the existing culvert, or via directional drilling under the watercourse. Methods will not cause requirement for any in-stream work or work that would directly affect watercourse morphology or cause potential for pollution of the watercourse.
PWS groundwater abstraction	Groundwater source	Route in proximity to PWS located on Hazelbank Road	Reduced water quality	Location of water supply should be confirmed prior to commencement on site and appropriate buffer zone established and maintained for the duration of the works.

2.59. Mitigation to address potential deterioration of water quality (due to excavations, runoff from the works, and use of oils fuels and lubricants) associated with the types of construction activities anticipated shall be similarly addressed by the surface water management and pollution prevention measures stated in Chapter 9: Geology and Water Environment and accompanying Technical Appendix 9.1: Surface Water Management Plan.

2.60. Given the short duration of construction and limited localised areas of disturbance proposed during the construction of the grid connection route, it is considered that there would be no significant impacts on the water quality or flow of the surface water and groundwater, or on the use of groundwater by identified abstractions and water supplies provided the mitigation measures set out above are adopted.

Fisheries & Aquatic Ecology

2.61. The proposed underground grid route considers two options; Option 1 connecting to Kells Substation and Option 2 to Ballymena substation.

2.62. 24 watercourses are crossed by optional Route 1 between the proposed Unshinagh Wind Farm Substation and the Kells Substation.17 watercourses are crossed by optional Route 2 between the proposed Unshinagh Wind Farm Substation and the Ballymena Substation. As detailed in the Geology and Water Environment section, these watercourses are spread across three major river catchments, the Glencloy, the Braid Water, and the Kells Water catchments. These watercourses are covered by six constituent waterbodies as defined under the WFD; the most recently available ecological status assessments were determined for 2018 as follows:

- Glencloy River (UKGBNI1NE040403061), Good Ecological Status;
- Braid River – Aghacully (UKGBNI1NE030308214), Good Ecological Status;

- Braid River – Broughshane (UKGBNI1NE030308212), Good Ecological Status;
- Braid River – Ballymena (UKGBNI1NE030302018), Moderate Ecological Potential;
- Kellswater (Moorfields) River (UKGBNI1NE030302161) Good Ecological Status;
- Kellswater (Kells) River (UKGBNI1NE030302014) Moderate Ecological Status;

2.63. Several crossing points for either the two options include main channels such as the Braid Water, the Kells Water and the Glencloy Water. The Braid and Kells main cahnnel crossings are highly significant and sensitive in terms of channel size and fisheries sensitivity due to the presence of Atlantic Salmon and potentially lamprey species. While the remainder of watercourse crossings are relatively small, most are likely to support at least trout and possibly salmon, and likely to range from Medium to Very High sensitivity with regard to fisheries and aquatic ecology.

2.64. Installation of the cable should be within the existing bridge structure at all watercourse crossing locations provided there is sufficient excavation depth. If this cannot be achieved, installation should be by directional drilling under the watercourse. Either approach will avoid any interference with the integrity of the stream channel and will therefore not result in any loss of or damage to aquatic habitats. Similarly, there will be no interruption to fish passage within stream channels provided that installation beneath culverts or bridges is via directional drilling.

2.65. Construction processes should follow industry standard guidelines to ensure that no sediment or other polluting substances are released into the watercourses. Of importance are guidelines outlined in the Good Practice Guidance (GPP) notes (https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/guidance-for-pollution-prevention-gpps-full-list/), particularlt, “Understanding your environmental responsibilities – good environmental practices (GPP1), and “Works and maintenance in or near waters” (GPP5).

2.66. At the post-consent stage, a full design methodology for cable installation, including options for directional drilling, will be developed and appropriate mitigation included in the finalised Construction Environmental Management Plan (CEMP).

2.67. With the suggested mitigation it is predicted that there will be no residual effects on fisheries and aquatic ecology.

Cultural heritage and archaeology

2.68. 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 routes (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).

2.69. 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

2.70. The search area for both cable route options was reviewed, and a total of 88 listed buildings, 3 scheduled monuments, 119 industrial historic assets and 85 archaeological monuments are located within this area. Appendix 2.1 – Cultural Heritage Figures 1 - 4 shows the two routes of the proposed grid connection and the location of cultural heritage assets within the search area, and the heritage assets considered as part of this assessment are listed in Appendix B.

Archaeological potential

Introduction

2.71. 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 both of the cable routes have a low potential to contain buried archaeological remains of high significance, that would require an alteration to the proposed route.

2.72. The archaeological potential of each cable route is considered in more detail below.

Ballymena Cable Route

2.73. The Ballymena cable route passes immediately to the south of the scheduled remains of Drumfane Moat (HED ref ANT 032:022). The moat has the following description in the NIHER:

2.74. *Described in PSAMNI as, "456 ft in circumference at base, rising to 28ft in height; flat top 54ft by 39ft; trench 10ft to 12ft deep. The bailey was originally rectangular, measuring 180ft by 170ft along the sides at the base. A wide trench separates the mote from the bailey; the latter has recently been much destroyed through the carting away of soil for top-dressing by a neighbouring farmer". An archaeological evaluation was carried out on a development site to the E of Drumfane Motte, in an area which may originally have been inside the bailey. However, no features or artefacts of archaeological significance were found during the monitoring of topsoil removal from the site [NAC, 2010].*

2.75. While the scheduled area extends to just north of the Ballygarvey Road, which is where the cable route would run, the archaeological remains of interest are focussed on the earthworks further to the north, and earlier investigations have not found evidence that remains of high significance extend beyond the scheduled area. Therefore, while there is some potential for the presence of associated peripheral remains, such as field boundaries and other evidence of agricultural management, but there is a low potential for the presence of any other remains of interest.

2.76. The Ballymena route also passes over four bridges which are noted as industrial heritage assets:

- Knockan Bridge (IHR 06807:000:00)
- Tullymore Bridge (IHR 06810:000:00)
- Priests Bridge (IHR 06787:000:00)
- Fork Bridge (IHR 06713:000:00)

2.77. 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.

Kells Cable Route

2.78. The Kells Cable Route passes through the site of a former Flaxmill and Cornmill in Buckna. A number of features are recorded by the NIHER:

- Site of Flax mill (IHR 6800:000:00)
- Flax mill (IHR 6800:004:00)
- Corn mill (IHR 6800:001:00)

2.79. The buildings are known from historic mapping, and seem to have been demolished in the 20th century, although some below ground remains may still survive. The road layout in the vicinity of the buildings is still reflective of that present when they were still in place, and so it is unlikely that the remains of these buildings will be located within the cable route. Therefore, while there is some potential for the presence of associated peripheral remains, such as field boundaries and other evidence of agricultural management associated with the flax and corn mills, there is a low potential for the presence of any other remains of interest

2.80. The Ballymena route also passes over four bridges which are noted as industrial heritage assets:

- Buckna Bridge (IHR 6799:000:00)
- Bridge (IHR 06921:000:00)
- Bridge (IHR 06924:000:00)
- Moorlands Station and Bridge (IHR 06780:014:00)

2.81. 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.

Potential Impacts

Construction Phase – Physical Impacts

2.82. 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.

2.83. 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. This would result in a slight adverse significance of effect in relation to these remains.

2.84. The cable trench would be excavated into the modern road surface of the bridged 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 negligible effect on these structures.

Operational effects

2.85. 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

2.86. 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, and could also contribute to understanding of other nearby archaeological remains of interest, such as the Drumfane moat. The archaeological monitoring works would be focussed on key areas of interest, such as the Drumfane moat, and the detailed scope of the works should be set out in a written scheme of investigation, the contents of which should be agree with the HED. This programme of archaeological works could be secured as a condition to planning consent.

2.87. 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.

Conclusions

2.88. 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. 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.

Noise

2.89. 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.

2.90. Construction activities with the potential to generate noise from grid connection construction are likely to include clearance of land, digging of trenches and backfilling of trenches and remediation.

2.91. 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) 20022. 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.

2.92. 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'3 this has been identified as being suitable for the purpose of giving guidance on appropriate methods for minimising noise from construction activities.

2.93. 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 LAeq criteria of: 65 dB(A) during weekdays (0700-1900) and Saturdays (0700-1300); below 55 dB(A) at evenings and weekends; and below 45 dB(A) for night-time (2300-0700) periods.

2.94. Noise levels due to the construction of the grid connection route will be mitigated by the short-term nature of the activity but further mitigation including the installation of acoustic barriers or the restriction of working hours per day could also be considered, if required.

2.95. There are many strategies to reduce construction noise and any mitigation adopted should not be limited to the measures suggested.

2.96. The Pollution Control and Local Government (NI) Order 1978 provides information on the need for ensuring that best practicable means are employed to minimise noise4. For all activities, measures will be taken to reduce noise levels with due regard to practicality and cost.

2.97. With appropriate mitigation, if required, it is assessed that there will be no residual significant effects during the construction phase.

2.98. There are no anticipated effects during the operational phase.

Traffic and transport

2.99. 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

[2] 'The Control of Noise (Codes of Practice for Construction and Open Sites) Order (Northern Ireland) 2002', The Department of the Environment, November 2002

[3] 'Code of Practice for Noise and vibration control on construction and open sites - Part 1: Noise', British Standards Institution, BS 5228-1:2009

[4] 'Pollution Control and Local Government (NI) Order 1978', published by Her Majesty's Stationary Office, 1978

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.

2.100. 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.

2.101. No significant residual effects are anticipated to occur.

2.102. When installed, the underground cable will have no adverse effect upon traffic during the operational phase.

Summary

Appendix 2.1 - Table 3 provides a summary of the potential environmental effects and proposed mitigation.

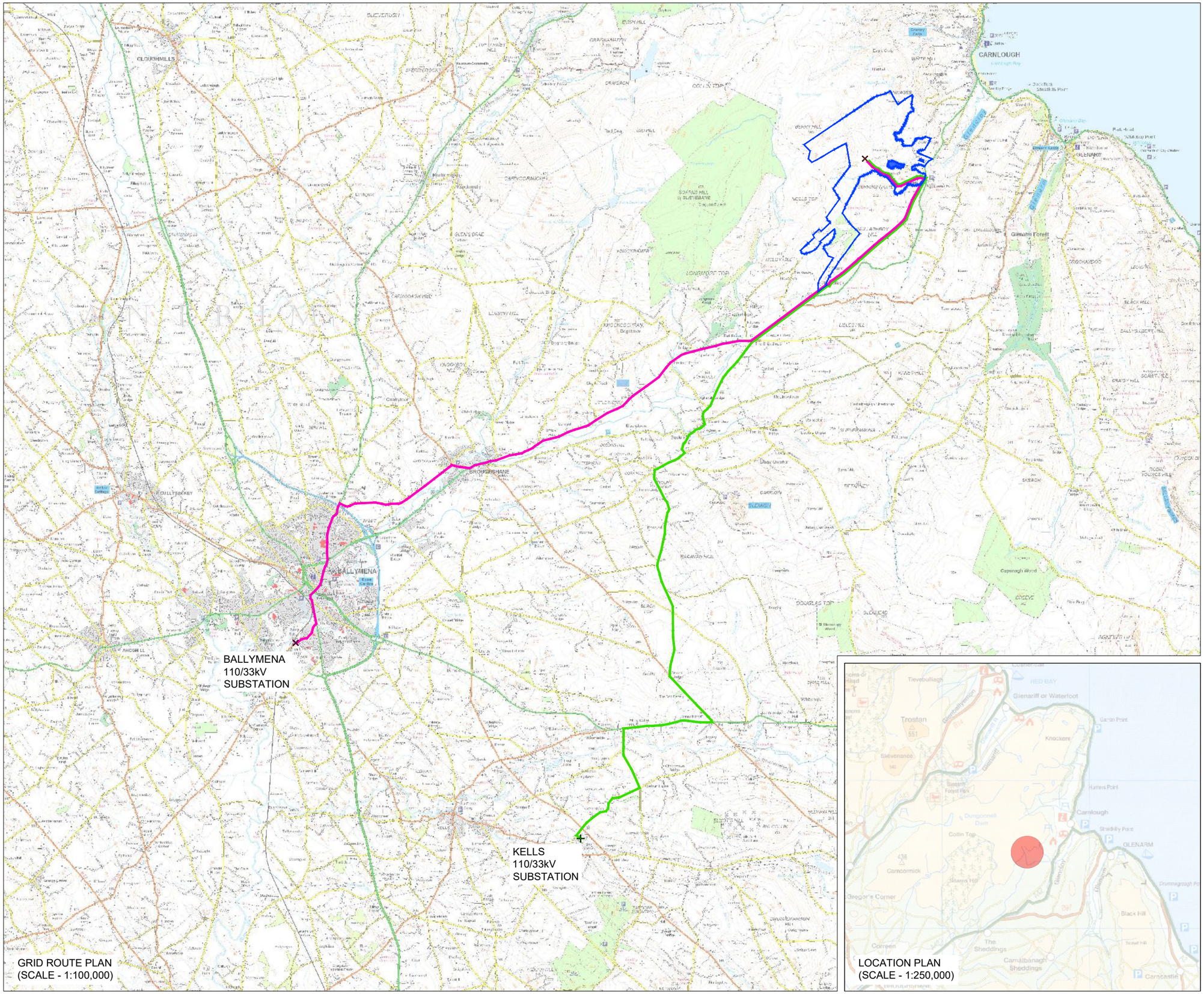
Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
Ornithology	Highly unlikely to be any significant adverse effects	Highly unlikely to be any significant adverse effects	None required	No residual effects
Fisheries	Sediment runoff & the release of other pollutants	Sediment runoff & the release of other pollutants	Adherence to GPP guidance Implementation of SuDs options Directional drilling mitigation Included in CEMP at final design stage	No residual effects
Noise	Potential short term noise increase at residential properties within the vicinity of the construction works	None	Installation of acoustic barriers or the restriction of working hours per day could be considered, if required.	No residual impacts

Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
	along the grid connection route.			
Transport and Traffic	Temporary local traffic disruption for the duration of the cable laying, including some temporary road closures.	None	Grid connection construction works should be undertaken in accordance with an agreed 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 to ensure any disruption during the underground cable works will be kept to a minimum.	No significant impacts
Ecology	Damage to habitat in roadside verge. Indirect impacts due to habitat disturbance along the route on faunal species which inhabit those habitats, which could include otter, bat species, smooth newt, badger, hedgehog and common lizard all of which have been recorded along or in close proximity to the route.		Tree roots should be protected by the implementation of BS5837:2005, where excavations will not be permitted inside the RPA (Root Protection Area). No spoil, vehicles, fuel, materials, temporary buildings or ancillary equipment should be stored inside the RPA. Existing ground levels within the RPA will not be raised or lowered. Pre-construction surveys to identify areas of sensitive habitat which should be avoided Pre-construction protected species surveys to identify species or features supporting 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 measures are properly implemented.	No significant impacts

Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
Geology, Hydrology & Hydrogeology	Limited potential for short term impacts associated with typical construction activities. Limited potential for short term impacts associated with works in proximity to areas of surface water flooding.	None	Appropriate surface water management and pollution prevention techniques around working areas, in line with good practice guidance, shall be implemented.	No significant impacts
Landscape and visual	Disturbance to grass verges, cutting and potential removal where necessary of hedgerows and trees.	None	All construction activities in close proximity to existing trees and mature hedgerows that are being retained should be carried out in accordance with BS 5837. An agreed arboricultural method statement should guide the works in relation to the erection of protective barriers, storage of materials, traffic, excavation and construction within zones of protection, the handling of tree roots, backfilling of trenches, etc. Drystone wall materials should, where disturbed or dismantled, be stockpiled for re-use. Excavated materials arising from the excavations that cannot be reused in reinstatement works should not be dumped onto roadside verges but should be removed from site on an ongoing basis during the construction period. Construction works should be planned such that they occur within as short a time period as reasonably practicable in order to minimise the period during which landscape and visual effects occur Where there is disturbance to grass verges it should be reinstated promptly on completion of the construction works subject	No significant impacts

Topic	Construction Impacts	Operational Impacts	Mitigation	Residual Effects
			to the appropriate ground and weather conditions.	
Archaeology and Cultural Heritage	Limited loss of some fragmentary archaeological remains along the cable routes, resulting in a **slight adverse** significance of effect.	None	Programme of archaeological monitoring and recording works which would realise the research value of any remains, and could enhance understanding of other known remains in the wider area.	Neutral

Appendix A



UNSHINAGH WIND FARM

APPENDIX 2.1

INDICATIVE GRID CONNECTION ROUTES

KEY

- LAND UNDER APPLICANTS CONTROL
- LAND NOT INCLUDED
- 110kV UNDERGROUND CABLE ROUTE (INDICATIVE): KELLS SUBSTATION
- 110kV UNDERGROUND CABLE ROUTE (INDICATIVE): BALLYMENA SUBSTATION
- KELLS 110/33 kV SUBSTATION LOCATION
- BALLYMENA 110/33 kV SUBSTATION LOCATION
- PROPOSED RES SUBSTATION LOCATION

LAYOUT DWG	T-LAYOUT NO.
N/A	N/A

DRAWING NUMBER
04291-RES-LAY-DR-EE-002

SCALE - 1:100,000 @ A3

EIA REPORT & PLANNING APPLICATION 2021

Appendix B

Appendix B – Heritage assets reviewed as part of baseline appraisal for cable route assessment

Heritage Assets Reviewed in relation to the Ballymena Cable Route

Listed Buildings

Historic Building Reference	Grade	Address	Grid Reference
HB07/17/006	B2	Old Parish Church Tower, Old Church Yard Entry, Church Street, Ballymena, Co. Antrim	D1094 0340
HB07/04/041	B1	Former Police Station, 5 Main Street, Broughshane, Co Antrim, BT42 4JW	D1500 0649
HB07/04/001	B	SECOND PRESBYTERIAN CHURCH, BROUGHSHANE BALLYMENA, CO.ANTRIM	D1482 0644
HB07/04/002	B+	FIRST PRESBYTERIAN CHURCH, 54 MAIN ST, BROUGHSHANE, CO.ANTRIM	D1502 0663
HB07/04/003 A	B	STEWART MEMORIAL FIRST PRESBYTERIAN CHURCH 54 MAIN ST. BROUGHSHANE CO.ANTRIM	D1505 0656
HB07/04/003 B	B	WHITE MEMORIAL FIRST PRESBYTERIAN CHURCH 54 MAIN ST. BROUGHSHANE CO.ANTRIM	D1502 0663
HB07/04/004 A	B	27 MAIN ST. BROUGHSHANE Ballymena CO.ANTRIM	D1507 0653
HB07/04/004 B	B	29 MAIN ST. BROUGHSHANE BALLYMENA CO.ANTRIM	D1508 0653
HB07/04/004 C	B	31 MAIN ST. BROUGHSHANE BALLYMENA CO.ANTRIM	D1508 0653
HB07/04/006	B+	The Thatch Inn 57 Main Street Broughshane Co. Antrim BT42 4JP	D1521 0657
HB07/04/007	B	79-81 MAIN ST. BROUGHSHANE BALLYMENA CO.ANTRIM	D1531 0659

Historic Building Reference	Grade	Address	Grid Reference
HB07/04/009	B1	St Patrick's (C of I) Church Rathkeel Road Broughshane Ballymena Co Antrim	D1539 0651
HB07/04/010 A	B1	1 CARNLOUGH ROAD BROUGHSHANE Ballymena CO.ANTRIM	D1553 0664
HB07/04/010 B	B1	1 CARNLOUGH ROAD BROUGHSHANE Ballymena CO.ANTRIM	D1552 0665
HB07/04/015	B1	"THE RECTORY" 37 RACEVIEW ROAD BROUGHSHANE Ballymena CO.ANTRIM	D1460 0621
HB07/04/018 A	B	9 MAIN ST. BROUGHSHANE BALLYMENA CO.ANTRIM	D1502 0651
HB07/04/018 B	B	11 MAIN ST. BROUGHSHANE BALLYMENA CO.ANTRIM	D1503 0651
HB07/04/018 C	B	13 MAIN ST. BROUGHSHANE BALLYMENA CO.ANTRIM	D1503 0651
HB07/04/019	B1	Jubilee Water Pump On north side of Main Street near the Library Broughshane Ballymena Co. Antrim	D1503 0653
HB07/04/020 A	B1	76 BALLYGARVEY ROAD BROUGHSHANE Ballymena CO.ANTRIM	D1270 0548
HB07/04/020 B	B1	78 BALLYGARVEY ROAD BROUGHSHANE Ballymena CO.ANTRIM	D1271 0548
HB07/04/020 C	B	90 BALLYGARVEY ROAD BROUGHSHANE Ballymena CO.ANTRIM	D1272 0549

Historic Building Reference	Grade	Address	Grid Reference
HB07/04/020 D	B	92 BALLYGARVEY ROAD BROUGHSHANE Ballymena CO.ANTRIM	D1272 0549
HB07/04/021	B1	BALLYGARVEY 71 BALLYGARVEY ROAD BALLYMENA CO.ANTRIM	D1255 0542
HB07/04/022	B2	TELEPHONE KIOSK BESIDE 9 MAIN ST. BROUGHSHANE Ballymena CO.ANTRIM	D1502 0651
HB07/04/033	B1	KINBALLY HOUSE AND WATER TOWER 150 BALLYGARVEY ROAD BROUGHSHANE Ballymena Co Antrim	D1364 0635
HB07/05/008	B1	GLENCAIRN (NOW CARNCAIRN LODGE) 40 CARNLOUGH ROAD BROUGHSHANE CO.ANTRIM	D1657 0715
HB07/12/007 A	B2	1 HENRY ST BALLYMENA CO.ANTRIM	D1059 0289
HB07/13/002	B1	2, 2A AND 2B HENRY ST. BALLYMENA CO.ANTRIM	D1061 0291
HB07/16/001	B1	THE PENTAGON 38 GEORGE ST. BALLYMENA CO.ANTRIM	D1051 0331
HB07/16/002	B2	THE PENTAGON 19 GEORGE ST. BALLYMENA CO.ANTRIM	D1055 0331
HB07/16/003	B	2-14 GEORGE ST. BALLYMENA CO.ANTRIM	D1057 0323
HB07/16/005 B	B1	10 MILL ST. BALLYMENA CO.ANTRIM	D1072 0320
HB07/16/005 C	B1	12 MILL ST. BALLYMENA CO.ANTRIM	D1071 0320

Historic Building Reference	Grade	Address	Grid Reference
HB07/16/005 D	B1	14 MILL ST. BALLYMENA CO.ANTRIM	D1071 0320
HB07/16/005 E	B1	16 MILL ST. BALLYMENA CO.ANTRIM	D1071 0320
HB07/16/006 A	B2	1 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1057 0315
HB07/16/006 B	B2	3 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1057 0315
HB07/16/006 C	B2	5 CLONAVON ROAD BALLYMENA CO. ANTRIM	D1056 0314
HB07/16/006 D	B2	7 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1056 0314
HB07/16/006 E	B2	9 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1056 0314
HB07/16/006 F	B2	11 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1055 0314
HB07/16/006 G	B2	13 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1055 0313
HB07/16/006 H	B2	15 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1055 0313
HB07/16/006 I	B2	17 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1054 0312
HB07/16/006 J	B2	19 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1053 0312
HB07/16/006 K	B2	21 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1053 0312
HB07/16/006 L	B2	2 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1058 0313
HB07/16/006 M	B2	4 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1058 0313

Historic Building Reference	Grade	Address	Grid Reference
HB07/16/006 N	B2	6 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1058 0312
HB07/16/006 O	B2	8 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1057 0312
HB07/16/006 P	B2	10 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1057 0312
HB07/16/006 Q	B2	12 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1057 0311
HB07/16/006 R	B2	14 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1056 0311
HB07/16/006 S	B2	16 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1056 311
HB07/16/006 T	B2	18 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1056 0311
HB07/16/006 U	B2	20 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1055 0310
HB07/16/006 V	B2	22 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1054 0310
HB07/16/006 W	B2	24 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1054 0309
HB07/16/006 X	B2	26 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1054 0309
HB07/16/006 Y	B2	28 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1053 0309
HB07/16/006 Z	B2	30 CLONAVON ROAD BALLYMENA CO.ANTRIM	D1053 0309
HB07/16/019	B1	TOWN HALL BRIDGE ST./MILL ST. (MUSEUM AND ARTS CENTRE) BALLYMENA CO.ANTRIM	D1073 0317

Historic Building Reference	Grade	Address	Grid Reference
HB07/17/001	B+	ST. PATRICK'S CHURCH 57 CASTLE ST. BALLYMENA CO.ANTRIM	D1092 0303
HB07/17/002 A	B1	53 CASTLE ST. BALLYMENA CO.ANTRIM	D1085 0309
HB07/17/002 B	B1	55 CASTLE ST. BALLYMENA CO.ANTRIM	D1086 0307
HB07/17/003	B	FIRST PRESBYTERIAN CHURCH, MEETINGHOUSE LANE BALLYMENA CO.ANTRIM	D1089 0320
HB07/17/007 A	B1	135-137 CHURCH STREET BALLYMENA CO.ANTRIM	D1089 0339
HB07/17/007 B	B1	139-141 CHURCH STREET BALLYMENA CO.ANTRIM	D1089 0340
HB07/17/007 C	B1	143-147 CHURCH ST. BALLYMENA CO.ANTRIM	D1089 0341
HB07/17/007 D	B1	149 CHURCH ST. BALLYMENA CO.ANTRIM	D1090 0342
HB07/17/010	B	ALLIED IRISH BANK 78-80 WELLINGTON ST. BALLYMENA	D1082 0343
HB07/17/011	B2	25-29 HIGH ST. BALLYMENA CO.ANTRIM AKA ETAM BUILDING, TOWER CENTRE	D1068 0342
HB07/17/012	B	FAITH MISSION HALL 57 HIGH ST. BALLYMENA CO.ANTRIM	D1067 0352
HB07/17/014	B	METHODIST CHURCH BALLYMONEY ROAD BALLYMENA CO.ANTRIM	D1045 0353
HB07/17/015	B1	AUDLEY LODGE 29-31 BALLYMONEY ROAD BALLYMENA CO.ANTRIM	D1050 0353

Historic Building Reference	Grade	Address	Grid Reference
HB07/17/016	B	WEST CHURCH 15-19 BALLYMONEY ROAD BALLYMENA CO.ANTRIM	D1054 0346
HB07/17/017	B1	THE COURT HOUSE BALLYMONEY ROAD BALLYMENA CO.ANTRIM	D1054 0342
HB07/17/019	B	9-11 CHURCH ST. BALLYMENA CO.ANTRIM	D1078 0319
HB07/17/020	B	MC KENDRY'S PUB 21 BROUGHSHANE ST. BALLYMENA CO.ANTRIM	D1091 0350
HB07/17/021	B2	NORTHERN BANK 1 BROADWAY BALLYMENA CO.ANTRIM	D1087 0346
HB07/17/022	B1	ADAIR ARMS HOTEL 1-7 BALLYMONEY ROAD BALLYMENA CO.ANTRIM	D1054 0338
HB07/18/006	B1	AUDLEY COTTAGE 33 BALLYMONEY ROAD BALLYMENA CO.ANTRIM	D1048 0357
HB07/18/011	B1	OLD DISPENSARY 28 MOUNT ST. BALLYMENA CO.ANTRIM	D1060 0372
HB07/20/001	B	HERBISON MEMORIAL NEW CEMETRY DUNCLUG BALLYMENA CO.ANTRIM	D1091 0479
HB07/20/003	B	ALL SAINTS RC CHURCH, BROUGHSHANE ROAD BALLYMENA CO.ANTRIM	D1107 0398
HB07/20/005	B2	GATE LODGE, BALLYMENA CEMETERY CUSHENDALL ROAD BALLYMENA CO.ANTRIM	D1104 0477

Historic Building Reference	Grade	Address	Grid Reference
HB07/04/002 B	B2	First Presbyterian Church Hall Main Street, Broughshane, Co. Antrim, BT42 4JP	D1506 0659

Scheduled Monuments

COUNTY	SM NO	TOWNLAND	Description
ANT	029:004	DOONAN	Motte: Doonan Fort
ANT	032:022	BALLYGARVEY	Motte and bailey: Drumfane Moat
ANT	032:059	TOWN PARKS (BALLYMENA)	Cross-carved slab which is presently built into the east wall of the porch of St Patricks Church

Industrial Heritage

Industrial Heritage Reference	Description	LOCATION	GRID REF
01339:149:00	Station & Goods Store	BNCR Main Line, Belfast - L'derry	D10200317
01339:150:00	Bridge	BNCR Main Line, Belfast - L'derry	D10250311
01339:151:00	2 Bridges	BNCR Main Line, Belfast - L'derry	D10420296
01339:152:00	Bridge & Milepost	BNCR Main Line, Belfast - L'derry	D10470291
01339:153:00	Bridge	BNCR Main Line, Belfast - L'derry	D10530283
01339:154:00	Ballymena Goods : Goods Shed & Ex-Station	BNCR Main Line, Belfast - L'derry	D10590253
01339:155:00	Bridge	BNCR Main Line, Belfast - L'derry	D10520226
01339:156:00	Bridge	BNCR Main Line, Belfast - L'derry	D10080161
06687:000:00	Lignagh Bridge		D20621001
06692:000:00	Flax Mill site	On the Glencloy River	D27221463
06693:000:00	Cullinane Bridge		D27251464
06694:000:00	2 Old Ironstone Levels		D27091451
06710:000:00	Mill - Flax Mill site	On the Braid River	D23421085
06711:000:00	Flax Mill		D22141014
06712:000:00	Killycarn Bridge		D22411010
06713:000:00	Fork Bridge		D22300991
06714:000:00	Flax Mill	The Sheddings	D22620996
06715:000:00	Flax Mill site	On the River Braid	D22380956

Industrial Heritage Reference	Description	LOCATION	GRID REF
06757:000:00	Coach Factory	Between Georges St & the N end of Mill St	D10570328
06758:000:00	Ballymena Steam Mill, Chimney & Race (formerly distillery)	Between Galgorm St & Galgorm Rd	D10480321
06760:000:00	Bridge	From Bridge St to Henry St across River Braid	D10590296
06761:000:00	Beetling Mill	To N of River Braid near Harryville Bridge	D10720301
06762:000:00	Chemical Works	To E of High St, N of Wellington St	D10740338
06763:000:00	Coach Factory	Between Wellington & Church Sts	D10830334
06764:000:00	Gasworks	To W of St. Patricks Church	D10760306
06765:000:00	Corn Mill, (?) Beetling Engine	To S of Braid River	D10810291
06766:000:00	Linen Yarn Boiling House	To N of River Braid near Gasworks	D10810304
06767:000:00	Beetling Mill, Saw Mill - Saw Mill - Weaving Factory	Between railway line & Braid River	D10460275
06769:000:00	Steam Saw Mill	To S of Warden St	D11110388
06770:000:00	Steam Saw Mill & Chimney	To E of High St, S of Springwell Hill	D10720353
06771:000:00	Mortar Mill	Between Princes St and the railway	D10210321
06772:000:00	Soap Works	Between Princes St & railway	D10230320
06773:000:00	Block of 2 Limekilns	To W of railway, S of Galgorm Rd	D10290306
06774:000:00	Foundry	To W of Harryville Bridge, S of Braid River	D10530292
06775:000:00	Scutch Mill - Weaving Factory	Between River Braid & the railway	D10470278
06776:000:00	Iron Foundry	Between Railway St & the River Braid	D10480268
06777:000:00	Braid River Weaving Factory, Chimney & Bleaching Ground	To E of Braid River	D10450251
06778:000:00	Braidwater Spinning Factory	Between Millrace & River Braid	D10810298
06779:000:00	Prince Arthur Steam Saw Mill & Chimney	Between Queen St & railway	D10660259
06783:000:00	Weaving Factory	To S of Cullybackey Rd	D10370335
06784:000:00	Carriage Factory	To E of Bryan St, S of Wellington St	D10800330
06787:000:00	Priests Bridge - Breckagh Bridge		D20370932
06788:000:00	Corn Mill	On the Priests Burn	D20330926

Industrial Heritage Reference	Description	LOCATION	GRID REF
06789:000:00	Mill - Corn Mill site	On the Priests Burn	D20410914
06802:000:00	Bridge		D17000687
06803:000:00	Creamery	Outskirts of Broughshane	D15980682
06804:000:00	Corn Mill ; Beetling / Dye Mill site		D15240705
06805:000:00	Bridge		D15060687
06807:000:00	Knockan Bridge		D14430654
06808:000:00	Old Tannery & Beetling Engine - Old Tannery ; Flax Mill	Broughshane	D15170673
06809:000:00	Tullymore Mills	Broughshane	D15540679
06810:000:00	Tullymore Bridge		D15410663
06811:000:00	Flax Mill & Beetling Engine - Beetling Mill site	On the Braid River	D15440655
06824:000:00	Racefield Woollen Mills	Raceview, on the Braid River	D14200610
06825:000:00	Flax Mill site	On the River Braid	D13720611
06826:000:00	Beetling & Bleach Mill - Woollen Factory site	On the River Braid	D12770516
06885:000:00	Brickworks, Kiln		D10380200
06516:034:00	Bridge	Ballymena - Retreat Narrow Gauge Railway	D12080551
06516:042:00	Narrow Gauge Terminus & Goods Shed	Ballymena - Retreat Narrow Gauge Railway	D10200317
07681:001:00	Flax Mill		D22831006
07681:002:00	Flax Mill		D22821002
06516:037:00	Bridge	Ballymena - Retreat Narrow Gauge Railway	D11130498
06516:036:00	Bridge	Ballymena - Retreat Narrow Gauge Railway	D11360514
06516:035:00	Milepost	Ballymena - Retreat Narrow Gauge Railway	D11500523
06789:001:00	Mill - Corn Mill		D20400911
06789:002:00	Millrace	Breckagh	D20320919
06789:003:00	Mill Pond		D20160922
06826:001:00	Beetling & Bleach Mill - Woollen Factory		D12780513
06826:002:00	Millrace / Stream		D12980535
06826:003:00	Mill Pond		D12770518
06826:004:00	Bleach Green		D12610521
06824:001:00	Mill - Steam Loom Mill, Linen Factory - Woollen Mills		D14180606
06824:002:00	Millrace / Stream		D14190593
06804:001:00	Corn Mill & Kiln - Corn Mill		D15270707
06804:002:00	Bleach Mill ; Beetling Mill ; Beetling & Dye Works		D15250702

Industrial Heritage Reference	Description	LOCATION	GRID REF
06809:001:00	Corn Mill - Bleach & Corn Mill - Beetling, Corn & Saw Mills - Flax & Corn Mills		D15560675
06809:002:00	Millrace / Stream		D15410683
06809:003:00	Bleach Green		D15520669
06811:001:00	Ruin Mills - Flax Mill & Beetling Engine - Beetling Mill		D15420653
06811:002:00	Millrace		D15800647
06785:000:00	Leighmore Weaving Factory & extensive Bleach Green	To W of Braid River	D10310234
01339:157:00(a)	Milepost	BNCR Main Line, Belfast - L'derry	D09970140

Archaeological Remains

SMR No	Feature Description	Period	Grid Reference
ANT028:012	RATH	E.CHRIST.	D2184010100
ANT028:024	SOUTERRAIN	E.CHRIST.	D2209009800
ANT028:025	MEGALITHIC TOMB: GIANT'S GRAVE (unlocated)	PREHISTORIC	D2100009500
ANT028:082	RATH	E.CHRIST.	D2150009950
ANT029:002	SHEEPFOLD	UNCERTAIN	D2594015140
ANT029:004	RAISED RATH? or MOTTE?: DOONAN FORT	E.CHRIST.; MEDIEVAL	D2738014070
ANT029:005	COURT TOMB: GIANT'S GRAVE	NEOLITHIC; PREHISTORIC	D2737013970
ANT029:023	WOODEN STAKES	UNCERTAIN	D2516011420
ANT029:024	CIST (unlocated)	BRONZE AGE; PREHISTORIC	D2510011300
ANT029:027	NATURAL FEATURE	UNCERTAIN	D2463011300
ANT029:028	MODERN ENCLOSURE	MODERN	D2398011280
ANT029:029	MODERN ENCLOSURE	MODERN	D2377011140
ANT029:030	ENCLOSURE - CASHEL?	UNCERTAIN	D2358011230
ANT029:042	CAIRN?: CARNAFANNOGE or SLANE (placename evidence only)	UNCERTAIN	D2479012080
ANT029:046	BULLAUN	E.CHRIST.	D2218009820
ANT029:061	NON-ANTIQUITY - clearance cairn	UNCERTAIN	D2251010510
ANT029:062	A.P. SITE - enclosure	UNCERTAIN	D2415010900
ANT029:063	DRAINAGE FEATURE & FIELD BOUNDARY	UNCERTAIN	D2417010630
ANT029:065	A.P. SITE - LARGE OVAL ENCLOSURE	UNCERTAIN	D2409011340
ANT029:070	TWO ENCLOSURES & FIELD SYSTEM	UNCERTAIN	D2548011620
ANT029:071	ENCLOSURE (part of field system ant 029:070)	UNCERTAIN	D2559011650
ANT029:074	A.P. SITE - LARGE ENCLOSURE?	UNCERTAIN	D2373010550
ANT029:090	BURIAL GROUND (unlocated)	UNCERTAIN	D2280010700
ANT029:098	SOUTERRAIN	E.CHRIST.	D2329010940

SMR No	Feature Description	Period	Grid Reference
ANT032:017	ENCLOSURE	UNCERTAIN	D1109005930
ANT032:018	SOUTERRAIN & ?RATH (OS memoirs)	E.CHRIST.; UNCERTAIN	D1127005920
ANT032:020	ENCLOSURE	UNCERTAIN	D1190005780
ANT032:021	SOUTERRAIN	E.CHRIST.	D1177005690
ANT032:022	MOTTE AND BAILEY: DRUMFANE MOTTE	MEDIEVAL	D1182005560
ANT032:023	TREE RING	MODERN	D1242005410
ANT032:024	TREE PLANTATION	MODERN	D1234005400
ANT032:028	STANDING STONE	PREHISTORIC ; UNCERTAIN	D1094004370
ANT032:049	A.P. SITE - large enclosure?	UNCERTAIN	D1132003540
ANT032:073	HISTORIC SETTLEMENT: BALLYMENA	POST-MED; MODERN	D1100003000
ANT033:004	CASTLE & BAWN	POST-MED; UNCERTAIN	D1513006630
ANT033:005	NATURAL MOUND: THE MOAT	UNCERTAIN	D1571006920
ANT033:013	HOLY WELL: FONS MIRACULOSIS, TOBERNASOOL or TUBBERNASOOL	UNCERTAIN	D1836007740
ANT033:043	ENCLOSURE	UNCERTAIN	D1283005870
ANT033:060	CAIRN: CARNKEERIN	BRONZE AGE; UNCERTAIN	D1722007380
ANT033:062	A.P. SITE - circular enclosure?	UNCERTAIN	D2131009400
ANT033:081	SOUTERRAIN	E.CHRIST.	D1738006980
ANT033:087	CISTED URN BURIAL (unlocated)	BRONZE AGE; PREHISTORIC	D1900008300
ANT033:088	TOMBSTONE (O.S. memoir site, unlocated)	UNCERTAIN	D1900008000
ANT033:089	BURIAL GROUND (O.S. memoir site, unlocated)	UNCERTAIN	D1600007000
ANT033:091	CIST BURIAL & UNCISTED BURIAL(S) (unlocated - this is Ant 033:090)	BRONZE AGE; UNCERTAIN	D1600007000
ANT033:093	STANDING STONE (unlocated)	PREHISTORIC ; UNCERTAIN	D1430006500
ANT037:021	ENCAMPMENT: CAMPHILL FORT	UNCERTAIN	D1057001620
ANT037:046	SOUTERRAIN	E.CHRIST.	D1114002330
ANT037:062	SOUTERRAIN	E.CHRIST.	D1070002600
ANT032:059	CROSS-SLAB	UNCERTAIN	D1090103037
ANT032:074	Workhouse	C19TH	D1094104379
ANT032:075	Workhouse Burial Ground	C19TH	D1084804317
ANT033:103	Broughshane Historic Settlement	C17TH; POST-MED	D1506106552

Heritage Assets Reviewed in relation to the Kells Cable Route

Listed Buildings

Historic Building Reference	Grade	Address	Grid Reference
HB07/11/008	B2	MOORFIELDS BRIDGE OVER THE GLENWHIRRY RIVER SPEERSTOWN ROAD MOORFIELDS Ballymena CO.ANTRIM	J1907 9924

Scheduled Monuments

COUNTY	SMNO	TOWNLAND	Description
ANT	029:004	DOONAN	Motte: Doonan Fort

Industrial Heritage

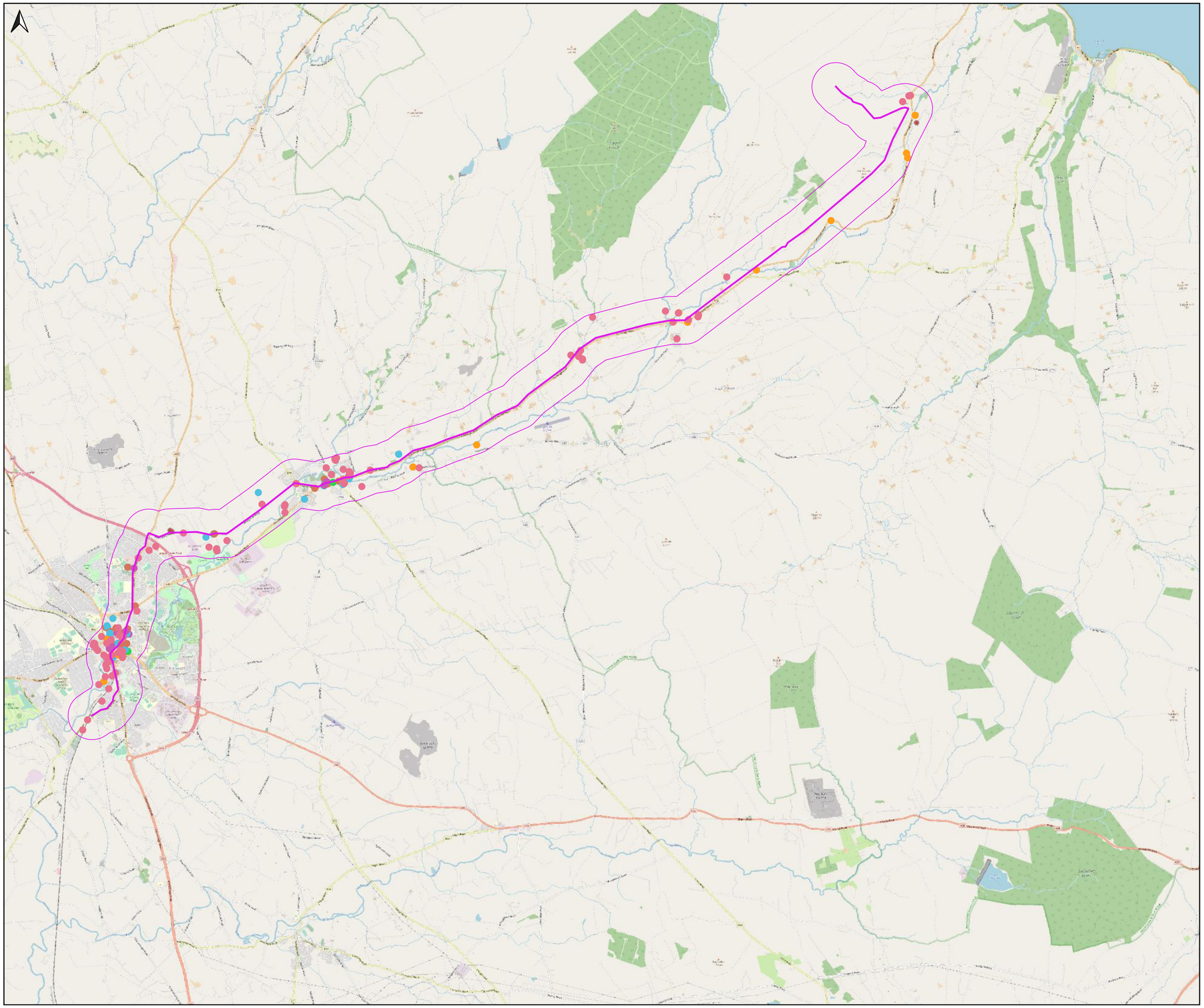
Industrial Heritage Reference	Description	LOCATION	GRID REF
06692:000:00	Flax Mill site	On the Glencloy River	D27221463
06693:000:00	Cullinane Bridge		D27251464
06694:000:00	2 Old Ironstone Levels		D27091451
06710:000:00	Mill - Flax Mill site	On the Braid River	D23421085
06711:000:00	Flax Mill		D22141014
06712:000:00	Killycarn Bridge		D22411010
06713:000:00	Fork Bridge		D22300991
06714:000:00	Flax Mill	The Sheddings	D22620996
06715:000:00	Flax Mill site	On the River Braid	D22380956
06790:000:00	Flax Mill site	On the Braid River	D21860910
06793:000:00	Stepping Stones - Aghacully Bridge		D21080833
06799:000:00	Buckna Bridge		D21010747
06800:000:00	Corn Mill - Corn Mill ; Flax Mill site	On the Glen Burn at Buckna	D20830738
06801:000:00	Flax Mill		D20930732
06813:000:00	Thompsons Bridge		D19660648
06917:000:00	Bridge		D20310084
06921:000:00	Bridge		J20679961
06923:000:00	Mill - Corn Mill site	On a tributary of the Glenwhirry River	J19759918
06924:000:00	Bridge		J19079924
06925:000:00	Beetling & Dye Works, Bleach Green & Beetling Mill site	Moorfields	J18719912

Industrial Heritage Reference	Description	LOCATION	GRID REF
06780:014:00	Moorfields Station & Bridge	Ballymena - Larne Harbour Narrow Gauge Railway	J19079918
07681:001:00	Flax Mill		D22831006
07681:002:00	Flax Mill		D22821002
06800:001:00	Corn Mill		D20820734
06800:002:00	Millrace		D21370722
06800:003:00	Mill Dam / Pond		D21050721
06800:004:00	Flax Mill		D20860736
06790:001:00	Flax Mill		D21860907
06790:002:00	Millrace / Stream		D21750897
06923:001:00	Mill - Corn Mill		J19739915
06923:002:00	Millrace		J19919913
06923:003:00	Dam - Mill Pond		J20019917
06925:001:00	Beetling & Dye Works		J18699908
06925:002:00	Millrace		J18999923
06925:003:00	Bleach Green		J18689900
06925:004:00	Beetling Mill		J18749891

Archaeological Remains

SMR No	Description	Period	Grid Reference
ANT029:004	RAISED RATH? or MOTTE?: DOONAN FORT	E.CHRIST.; MEDIEVAL	D2738014070
ANT029:005	COURT TOMB: GIANT'S GRAVE	NEOLITHIC; PREHISTORIC	D2737013970
ANT029:002	SHEEPFOLD	UNCERTAIN	D2594015140
ANT029:071	ENCLOSURE (part of field system ant 029:070)	UNCERTAIN	D2559011650
ANT029:070	TWO ENCLOSURES & FIELD SYSTEM	UNCERTAIN	D2548011620
ANT029:068	TWO STRUCTURES & THREE FIELD BOUNDARIES	UNCERTAIN	D2531011330
ANT029:023	WOODEN STAKES	UNCERTAIN	D2516011420
ANT029:024	CIST (unlocated)	BRONZE AGE; PREHISTORIC	D2510011300
ANT029:042	CAIRN?: CARNAFANNOGE or SLANE (placename evidence only)	UNCERTAIN	D2479012080
ANT029:027	NATURAL FEATURE	UNCERTAIN	D2463011300
ANT029:063	DRAINAGE FEATURE & FIELD BOUNDARY	UNCERTAIN	D2417010630
ANT029:062	A.P. SITE - enclosure	UNCERTAIN	D2415010900
ANT029:065	A.P. SITE - LARGE OVAL ENCLOSURE	UNCERTAIN	D2409011340
ANT029:028	MODERN ENCLOSURE	MODERN	D2398011280
ANT029:029	MODERN ENCLOSURE	MODERN	D2377011140
ANT029:074	A.P. SITE - LARGE ENCLOSURE?	UNCERTAIN	D2373010550
ANT029:030	ENCLOSURE - CASHEL?	UNCERTAIN	D2358011230
ANT029:098	SOUTERRAIN	E.CHRIST.	D2329010940

SMR No	Description	Period	Grid Reference
ANT029:046	BULLAUN	E.CHRIST.	D2218009820
ANT028:024	SOUTERRAIN	E.CHRIST.	D2209009800
ANT029:087	SOUTERRAIN (unlocated)	E.CHRIST.	D2200009000
ANT029:088	SOUTERRAIN (unlocated)	E.CHRIST.	D2200009000
ANT033:063	A.P. SITE - circular cropmark	UNCERTAIN	D2078008040
ANT033:067	NON-ANTIQUITY - drain	MODERN	D2059004670
ANT038:068	FIELD SYSTEM	UNCERTAIN	D2050001000
ANT033:017	STANDING STONE	PREHISTORIC; UNCERTAIN	D2035007140
ANT033:050	CHURCH, GRAVEYARD, ENCLOSURE, SOUTERRAIN & MILL RACE: ST. PATRICK'S CHAPEL or KILLYBANWAY (unlocated)	E.CHRIST.; UNCERTAIN	D2030006300
ANT033:016	ENCLOSURE	UNCERTAIN	D2016006750
ANT033:024	CHURCH SITE, GRAVEYARD & BULLAUNS: RATHCONA	UNCERTAIN; MED/L.MED	D1990005360
ANT033:080	SOUTERRAIN	E.CHRIST.	D1965006510
ANT038:015	COUNTERSCARP RATH	E.CHRIST.	J1919099160
ANT038:035	RATH	E.CHRIST.	J1813097480



Legend

Unshinagh Cable Routes, Antrim

- Ballymena Cable Route
- Ballymena 500m search area

Designated Heritage Assets

- Scheduled Monuments
- Ballymena Industrial Heritage
- Ballymena Defence Heritage

Listed Buildings

- B
- B+
- B1
- B2

Title:
Appendix 2.1 B, Cultural Heritage Fig. 1

Ballymena cable route distribution of designated heritage assets

Scale 1:75,000 at A3

Legend

Unshinagh Cable Routes, Antrim

- Ballymena Cable Route
- Ballymena 500m search area

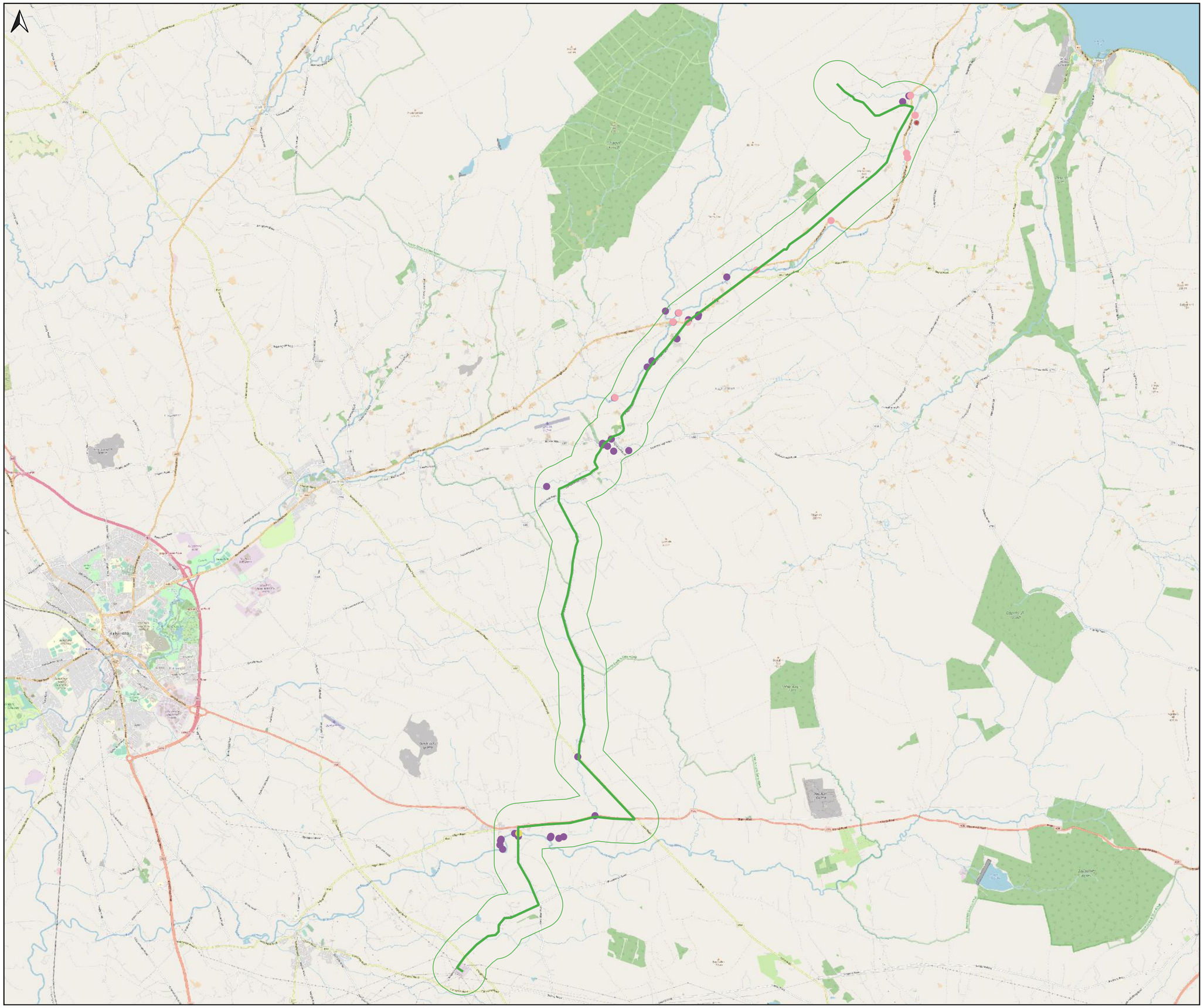
Ballymena Cable NISMR Data

- A.P. SITE
- BULLAUN
- BURIAL
- BURIAL GROUND
- CAIRN
- CIST
- CROSS SLAB
- DESIGNED LANDSCAPE FEATURE
- DUPLICATE
- ENCLOSURE
- FIELD SYSTEM
- FORTIFICATION
- HOLY WELL
- MEGALITHIC TOMB
- MOTTE & BAILEY
- MOUND
- NON-ANTIQUITY
- RATH
- SETTLEMENT
- SHEEPFOLD
- SOUTERRAIN
- STANDING STONE
- TOMBSTONE
- UNCERTAIN
- WORKHOUSE

Title:
Appendix 2.1 B, Cultural Heritage Fig. 2

Ballymena cable route distribution of non-designated heritage assets

Scale 1:75,000 at A3



Legend

Unshinagh Cable Routes, Antrim

- Kells Cable Route
- Kells 500m search area

Designated Heritage Assets

- Kells Scheduled Monuments
- Kells Defence Heritage
- Kells Industrial Heritage

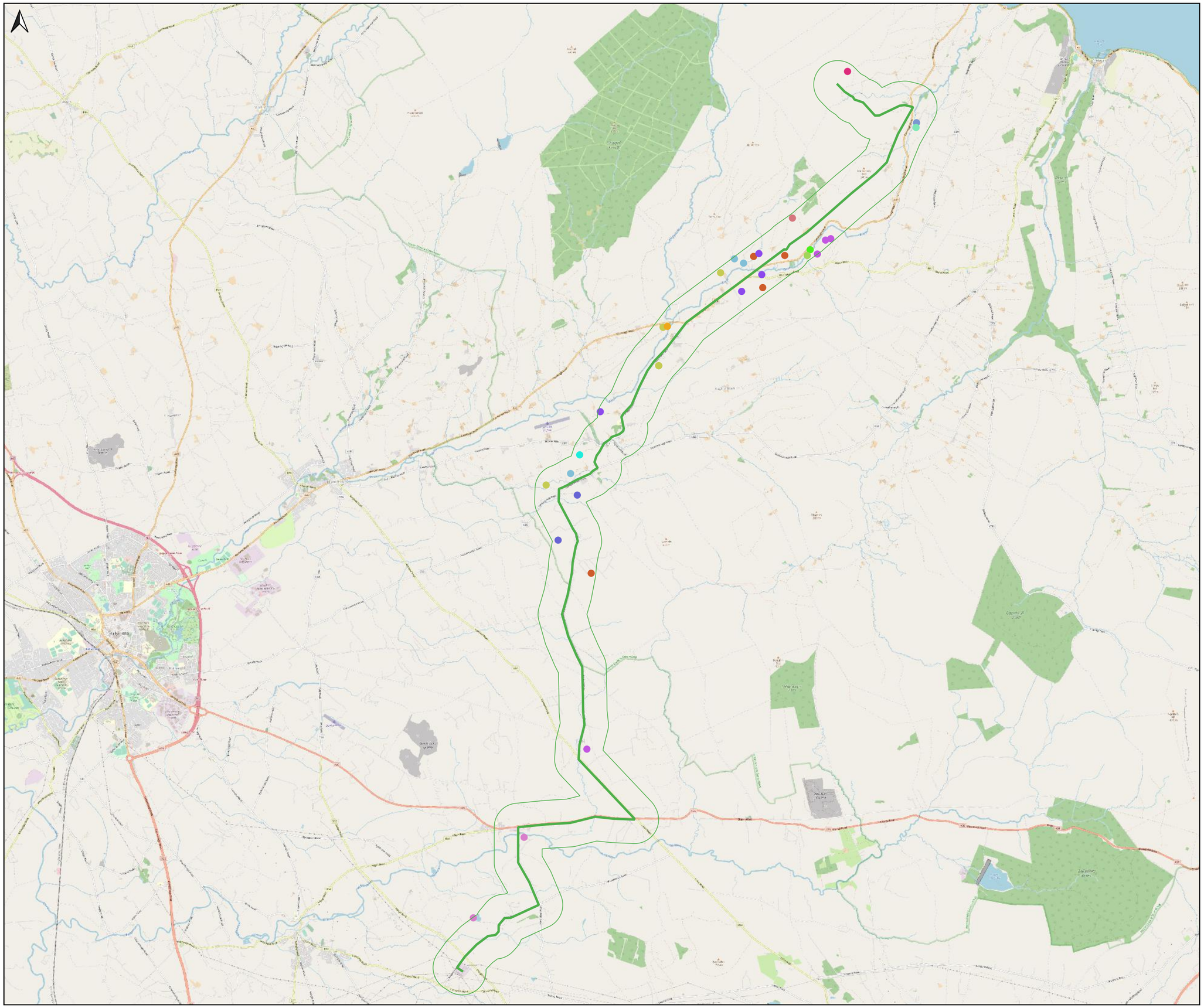
Kells Listed Buildings

- B2

Title:
Appendix 2.1 B, Cultural Heritage Fig. 3

Kells cable route distribution of designated heritage assets

Scale 1:75,000 at A3



Legend

Unshinagh Cable Routes, Antrim

- Kells Cable Route
- Kells 500m search area

Kells Cable NISMR

- A.P. SITE
- BULLAUN
- CAIRN
- CIST
- ECCLESIASTICAL SITE
- ENCLOSURE
- FIELD SYSTEM
- MEGALITHIC TOMB
- MOUND
- NON-ANTIQUITY
- RATH
- SHEEPFOLD
- SOUTERRAIN
- STANDING STONE
- UNCERTAIN

Title:
Appendix 2.1 B, Cultural Heritage Fig. 4

Kells cable route distribution of non-designated heritage assets

Scale 1:75,000 at A3

Appendix 2.2 Turbine Lighting

Introduction

To meet net zero targets, wind turbines need to increase their energy capacity and one way to achieve this is to increase the size of the rotor blades, which in turn necessitates an increased tip height. However, it is legislated in the UK that obstacles above 150 metres are required to have aviation lighting fitted so due consideration has been given to Unshinagh Wind Farm in this respect.

Article 222 of the Air Navigation Order (ANO) 2016 (amended 2021) states that an en-route obstacle must be fitted with medium intensity (2000 candela) steady red aviation lights as close as possible to the top of the obstacle and at intermediate levels between the top lights and ground level unless the aviation authority has granted permission not to fit lights.

A wind turbine with tip height of 150 metres or more, not located in the vicinity of a licensed aerodrome, is defined as an 'en-route obstacle' for the purposes of aviation.

In June 2017, the Civil Aviation Authority (CAA) issued a policy statement related to lighting of onshore wind turbines for tip heights in excess of 150 metres above ground level (AGL) to clarify the UK application of ANO Article 222.

The CAA considers the top of a wind turbine generator to be the maximum blade tip height, however, in terms of locating the aviation lighting on a wind turbine, the ANO term, *"as close as possible to the top of the obstacle"*, is deemed to be on the nacelle

The CAA requires that a wind turbines are:

- Fitted with a medium intensity (2000 candela) red light on the nacelle that displays in all directions, along with a second back up light in case of failure
- Fitted with at least three (to provide 360 degree coverage) low-intensity (32 candela) lights at an intermediate level of half the nacelle height
- Operated by an acceptable control device to ensure the lights will be turned on when illuminance falls below 500 LUX and turns the lights off when the illuminance rises to a level of 500 LUX or more

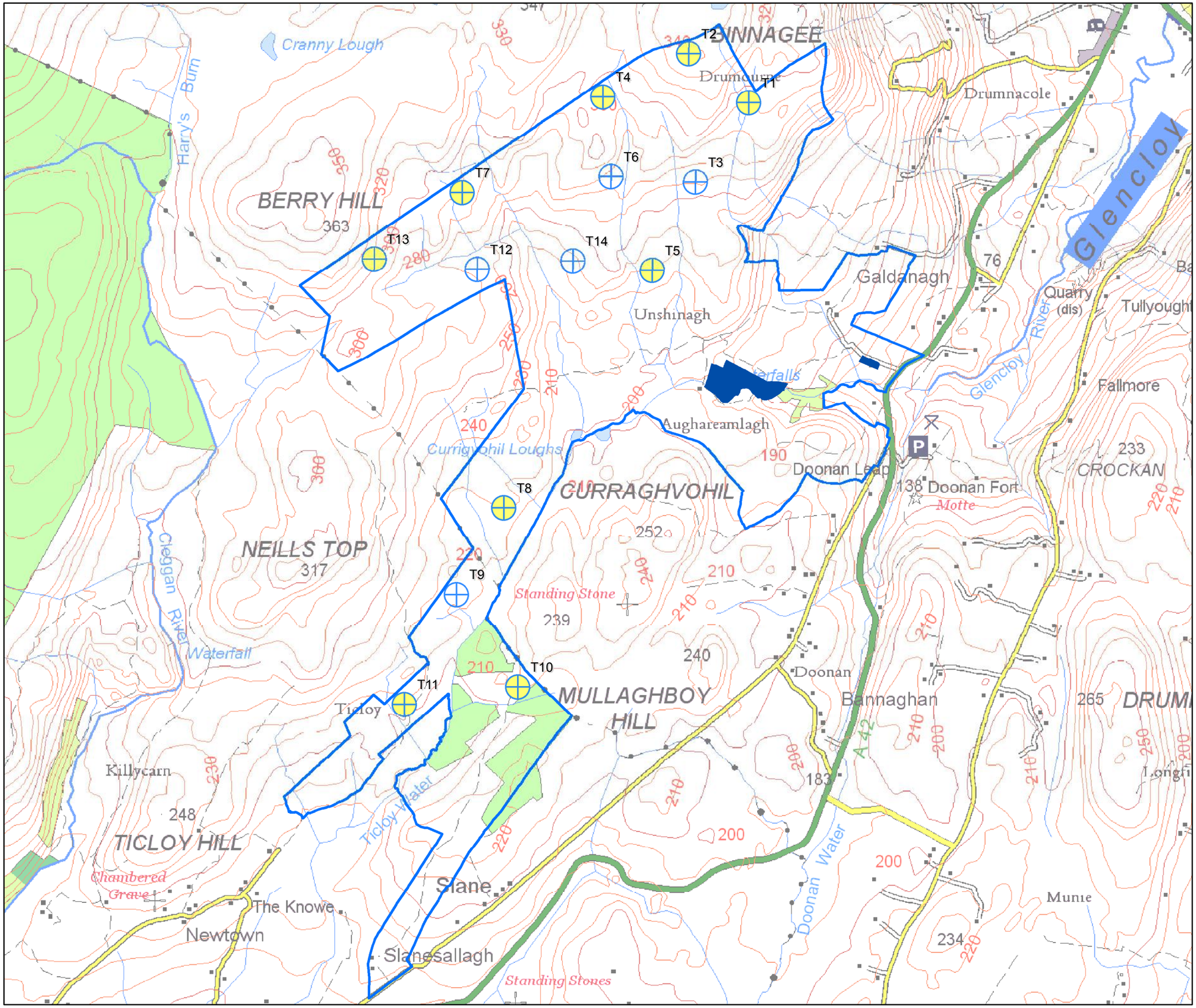
Proposal

The CAA has been consulted about the lighting requirement for Unshinagh. Given that the site is in a relatively low area of activity from an aviation perspective, an 'in principle' night time aviation lighting scheme has been agreed with the CAA as a variation to the lighting requirements specified in ANO Article 222, as follows:

- Medium intensity steady red (2000 candela) lights on the nacelles of nine of the fourteen turbines, specifically, T01, T02, T04, T05, T07, T08, T10, T11 and T13
- A second 2000 candela light on the nacelles of turbines T01, T02, T04, T05, T07, T08, T10, T11 and T13 to act as alternates in the event of a failure of the main lights
- These lights must be capable of being dimmed to 10% of peak intensity when the visibility as measured at the wind farm exceeds 5 km

- Ministry of Defence (MOD) specification infra-red lights installed on the nacelles of perimeter turbines
- Intermediate level 32 candela lights are not required to be fitted on the turbine towers

A final scheme for aviation lighting will be agreed with the CAA post planning consent.



UNSHINAGH

APPENDIX 2.2

UNSHINAGH AVIATION LIGHTING SCHEME

- Turbines
- Lit Turbines
- Land Under Applicant's Control
- Areas Not Under Applicant's Control

Discussions to date with the CAA have indicated that it will not be necessary to illuminate all turbines.

To maintain air safety in the area, it is suggested that it will be sufficient to install aviation lights on 9 of the 14 turbines.

Turbines T1, T2, T4, T5, T7, T8, T10, T11 and T13 are shown as lit in this figure.

LAYOUT DWG	T-LAYOUT NO.
N/A	PNIRuns024

DRAWING NUMBER

04291-RES-LAY-DR-TE-034

SCALE - 1:21,000 @ A3

ENVIRONMENTAL STATEMENT & PLANNING APPLICATION 2021