SONI TRANSMISSION DEVELOPMENT PLAN FOR NORTHERN IRELAND 2023-2032

Strategic Environmental Assessment

Environmental Report

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Strategic Environmental Assessment

Environmental Report

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ABBREVIATIONS

AA	Appropriate Assessment
AONB	Area of Outstanding Natural Beauty
AoHSV	Area of High Scenic Value
APIS	Air Pollution Information System
APSFR	Area of Potential Significant Flood Risk
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ASSI	Area of Special Scientific Interest
ASAI	Area of Significant Archaeological Interest
BGE	Bord Gáis Energy
BGTL	Belfast Gas Transmission Limited
DAERA	Department of Agriculture, Environment and Rural Affairs
DAFM	Department of Agriculture, Food and the Marine
DECC	Department of the Environment, Climate and Communications
DEFRA	Department for Environment, Food & Rural Affairs
DfI	Department for Infrastructure
DHLGH	Department of Housing, Local Government and Heritage
DoH	Department of Health
DSD	Department for Social Development
DWPA	Drinking Water Protected Area
EAR	Environmental Appraisal Report
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EPA	Environmental Protection Agency
EPO	Environmental Protection Objective
FCS	Favourable Conservation Status
FRMP	Flood Risk Management Plan
GBF	Global Biodiversity Framework
GES	Good Environmental Status
GHG	Green House Gas
GIS	Geographical Information System
GSNI	Geological Survey of Northern Ireland
HED	Historic Environment Division
HERoNI	Historic Environment Record of Northern Ireland
HRA	Habitats Regulations Assessment
HVDC	High Voltage Direct Current
INNS	Invasive Non Native Species

JNCC	Joint Nature Conservation Committee
LAQM	Local Air Quality Management
LCA	Landscape Character Area
LPSNI	Land & Property Services Northern Ireland
MCZ	Marine Conservation Zones
MSFD	Marine Strategy Framework Directive
NHA	Natural Heritage Area
NIE	Northern Ireland Electricity
NIEA	Northern Ireland Environment Agency
NIFRA	Northern Ireland Flood Risk Assessment
NILCA	Northern Ireland Landscape Character Assessment
NIO	Northern Ireland Office
NIRLCA	Northern Ireland Regional Landscape Character Assessment
NISRA	Northern Ireland Statistics and Research Agency
NNR	National Nature Reserve
PNHA	Proposed Natural Heritage Area
PPC	Pollution Prevention and Control
RBD	River Basin District
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEO	Strategic Environmental Objective
SLNCI	Sites of Local Nature Conservation Importance
SMR	Site and Monuments Record
SONI	System Operator for Northern Ireland
SPA	Special Protection Area
TDP	Transmission Development Plan
TDPNI	Transmission Development Plan for Northern Ireland
TESNI	Tomorrow's Energy Scenarios Northern Ireland
TSO	Transmission System Operator
UKCP	United Kingdom Climate Prediction
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
WFD	Water Framework Directive

NON-TECHNICAL SUMMARY

Introduction

In line with its licence obligations as Transmission System Operator (TSO) in Northern Ireland, the System Operator for Northern Ireland (SONI) is obliged to draft a 10-year Transmission Development Plan outlining projects that are needed for the operation of the transmission system. Using the most up to date information on the current and projected future requirements for the operation of a secure, reliable grid, the Transmission Development Plan for Northern Ireland (TDPNI) is currently being compiled. In addition, future needs that may drive future potential projects will also be considered.

The TDPNI will present the potential projects required in Northern Ireland over the next 10 years (2023-2032) to reinforce the electrical transmission grid and ensure the connection of generation and demand for Northern Ireland.

Substantial system reinforcement is required to ensure that the transmission system continues to meet the planning standards as changes to the generation portfolio and demand occur over time including the connection of renewable generation. When considering system reinforcement SONI is obliged to balance the costs to the consumer, system security and its impact on the environment.

The TDPNI is being prepared in accordance with Article 22 of European Directive 72/2009 and Condition 40 of the SONI TSO Licence. In accordance with the license condition the TDPNI has the following overarching objectives, which are the key drivers for the Plan:

a) Indicate to market participants the main transmission infrastructure that needs to be built or upgraded over the next ten years;

b) Contain all the investments already approved by the Utility Regulator and identify new investments which have to be executed in the next three years;

c) Provide for a time frame and estimate of costs (where reasonable) for all investment projects;

d) Contain such other matters as shall be specified in directions issued by the Utility Regulator from time to time for the purposes of the condition; and

e) Contain a reasonable number of future scenarios, which reflect uncertainties and shall, as far as practicable, be consistent with scenarios that licensee uses in other relevant areas of work.

Description of the Transmission Development Plan for Northern Ireland 2023-2032

The TDPNI is a national level Plan that will cover the electricity transmission system in Northern Ireland and will link into the transmission systems of the Republic of Ireland and Great Britain. While the TDPNI is primarily concerned with grid development projects in Northern Ireland, the draft TDPNI and associated environmental documents will have careful regard to any likely significant environmental effects of a transboundary nature.

The geographic scope of the SEA (i.e., the area with a potential to be impacted by the developments of the TDPNI) will primarily focus on grid development projects in at a national to regional scale, while having careful regard to be mainly within Northern Ireland, within the vicinity of proposed developments, while having careful regard to any likely significant environmental effects of a transboundary nature in the Republic of Ireland on a case by case basis.

The draft TDPNI is proposed to cover the period from 2023 to 2032. Projects from the TDPNI that are likely to be progressed over the next 10 years will be detailed within the Plan. The TDPNI will be a rolling plan, which will be subject to annual updates as per licence requirements set out by the Utility Regulator.

As implementation of many of the projects outlined in the TDPNI 2023-2032 will be on a supply and demand basis, there may be no specific timeframe for their development, or certainty as to whether they will be developed. It is proposed that the SEA will consider the potential for short-term (construction phase), medium-term (re-establishment and initial operational phase, considered as 0-5 years post-construction), and long-term (operational phase, 5 years post-construction onwards) impacts from implementing the proposed projects set out in the draft TDPNI 2023-2032, in line with the requirements of the SEA Directive.

The draft TDPNI has defined a list of the potential projects that could be developed within the Plan period up to 2032. These are all “development alternatives” available to the plan. A number of these potential projects were screened out of requiring assessment as the works are of such a scale as not to be considered significant and / or are localised to within existing electrical transmission sites / substations, or as the proposals have gone beyond strategic planning to the detailed planning stage and so will only be considered for cumulative and in-combination impacts. The projects that were screened in and are assessed in the SEA are presented in **Table 0-1.** The development types and associated construction methods are also discussed in **Section 2.**

Table 0-1. Project Options Screened in and Assessed in the SEA

Project ID	Project Name	Development Type
1	Moyle Interconnector Capacity Increase	New Transmission Line
2	Armagh and Drumnakelly Reinforcement	New Substation and Transmission Line
3	East Tyrone Reinforcement	Substation Extension
4	Newry Reinforcement	New Substation and New / Uprate Transmission Line
5	Coolkeeragh - Limavady - Coleraine 110 kV Uprating	Transmission Line Restring / Uprate
6	Drumnakelly - Tamnamore 110 kV Uprating	Transmission Line Underground Cables and Restring / Uprate
7	Ballylumford - Ballyvallagh uprate	Transmission Line Restring / Uprate
8	New NW 110 kV Switching Station	New Substation and New / Uprate Transmission Line
9	Coolkeeragh 110 kV Extension	Substation Extension
10	Energising Belfast	New Substation and Transmission Line
11	Eden-Carnmoney Reinforcement	Transmission Line Underground Cables and Restring / Uprate
12	Coolkeeragh-Killymallaght-Strabane 110 kV Uprating	Transmission Line Restring / Uprate
13	Omagh - Strabane 110 kV Uprating	Transmission Line Restring / Uprate
14	Mid Antrim Upgrade	New Substation and Transmission Line, Transmission Line Restring / Uprate
15	Northwest 110 kV Reinforcement	New Transmission Line
16	Omagh - Dromore Uprating	Transmission Line Restring / Uprate
17	Mid Tyrone Upgrade	New Transmission Line and Underground Cables
18	North Sperrin Generation Substation	New Substation, Substation Extension, New Transmission Line and Underground Cables
19	Cam Cluster	New Substation
20	Castlereagh 275 kV Redevelopment	New substation or Substation Extension
21	Coolkeeragh 275 kV Redevelopment	New substation or Substation Extension
22	Kells 275 kV Redevelopment	New substation or Substation Extension
23	Magherafelt 275 kV Redevelopment	New substation or Substation Extension
24	Tandragee 275 kV Redevelopment	New substation or Substation Extension

Environmental Baseline

An environmental baseline was produced by SEA environmental topic. The full environmental baseline can be found in **Section 3** of this report. The purpose of this section is to demonstrate the level of baseline environmental information to be used in the assessment of potential effects of the proposed projects / options.

Biodiversity, Flora & Fauna

There are a wide variety of natural habitats and species within the overall study area, protected by a range of designations. There are 51 Northern Ireland Priority Habitats and 594 Priority Species. Sites have been designated to provide protection to those habitats and species considered to be of particular conservation value. There are 58 Special Areas of Conservation (SACs) and 16 Special Protection Areas (SPAs) within Northern Ireland. There are 20 internationally protected Ramsar sites within Northern Ireland. Northern Ireland has 49 habitats listed in Annex I of the Habitats Directive, of which 13 are priority habitats, and 18 species listed in Annex II of the Directive. There are 394 Areas of Special Scientific Interest (ASSI) within Northern Ireland. Within Northern Ireland there are 50 National Nature Reserves (NNRs) and five designated Marine Conservation Zones (MCZs). In addition to these marine designated areas, other prominent surface waterbodies include the 413 rivers and 20 lakes which contain salmonid species, along with the six Fresh Water Pearl Mussel catchments in Northern Ireland. There are seven designated areas for the protection of shellfish production and production within Northern Ireland. There are 940 Sites of Local Nature Conservation Importance (SLNCI) within Northern Ireland; along with 10 RSPB Nature Reserves and 18 Ulster Wildlife Nature Reserves. There are also over 110 km^2 of ancient woodlands within Northern Ireland. Some designated sites within the Republic of Ireland extend into Northern Ireland, and others are in close proximity; there may therefore be potential for transboundary effects on these sites from implementation of the draft TDPNI. There are 30 SACs, 12 SPAs, 13 Natural Heritage Areas (NHAs) and 100 proposed Natural Heritage Areas (pNHAs) in the Republic of Ireland within 15 km of the boundary with Northern Ireland.

Population & Human Health

In 2021, there were approximately 1.903 million people living in Northern Ireland. The population density of Northern Ireland in 2021 was 135 people per km^2, with the higher density population areas located within cities and towns across Northern Ireland, mainly Belfast, Derry / Londonderry and Lisburn. Over two-thirds of all residents in Northern Ireland aged 16 to 64 years were economically active in the 2021 census (70.2%). Just under four-fifths (78.7%) of Northern Ireland residents reported themselves to be of good or very good general health in the 2021 Census. Within Northern Ireland there are several areas which would be considered socially sensitive, including peace line areas and Neighbourhood Renewal Areas, of which there 22 and 36 respectively.

Geology, Soils & Land use

There are 148 ASSIs in Northern Ireland that are designated for, or partially for, their Earth Science interest, and may be considered as geological heritage. The one UNESCO world heritage site in Northern Ireland, the Giant's Causeway, is designated for its unique geological heritage. Throughout Northern Ireland, superficial deposits are made up largely of peat, alluvium (clay, silt and sandstone) and till. The land use within Northern Ireland is predominantly 'Pastures', followed by 'Natural Grassland, 'Moors and Heathland' and 'Peat Bogs'. Areas of sensitive land use and soils for transmission infrastructure development in Northern Ireland have been identified as cultivated lands, peatlands, ancient woodland and commercial forestry. Additional land types and land uses that may be constraints to transmission development include quarries, mines, landslide areas, unstable grounds, and potentially contaminated sites.

Water

There are 496 surface water bodies within Northern Ireland – 450 rivers, 21 lakes and 25 transitional and coastal water bodies. In 2015, 33% of the 450 river water bodies in Northern Ireland were classified as good or high overall status. In 2018, 31% were classified as good or high overall status. In 2021, no river water bodies achieved good or high overall status. Considering ecological status, 32% of river water bodies achieved good or high ecological status in 2021, in comparison to 31% in 2018 and 33% in 2015. In addition, when the chemical status of river water bodies is considered excluding uPBT substances and cypermethrin for comparative purposes, 93% achieved good chemical status in 2021, compared to 91% in 2018 and 52% in 2015.

In 2015, 36% of the 25 transitional and coastal water bodies were classified as good or high overall status. In 2018, 40% were classified as good or high overall status. In 2021, no water bodies achieved good or high overall status. Considering ecological status, 40% of water bodies achieved good ecological status in 2021, in comparison to 40% in 2018 and 3% good and 6% high status in 2015. In addition, when the chemical status of water bodies is considered excluding uPBT substances and cypermethrin for comparative purposes, 88% achieved good chemical status in 2021, compared to 44% in 2018 (of 16 assessed water bodies) and 20% in 2015 (of 16 assessed water bodies).

In both 2015 and 2018, 24% of the 21 lake water bodies were classified as good overall status. In 2021, no lake water bodies achieved good or high overall status. Considering ecological status, 14% of water bodies achieved good ecological status in 2021, in comparison to 24% achieving good or high status in 2018 and 2015. In addition, when the chemical status of water bodies is considered excluding uPBT substances and cypermethrin for comparative purposes, in 2015, 2018 and 2021, all 21 (100%) lake water bodies were classified as good chemical status.

Of the surface water bodies in Northern Ireland, 26 surface water bodies are designated as Drinking Water Protected areas. In addition, there are 26 designated bathing waters. Northern Ireland has a total of 75 groundwater bodies, 65% of which were of good status in 2015, and 68% are of good status in 2021. Of these groundwater bodies, 65 are designated as Drinking Water Protected Areas.

There is a significant degree of fluvial flood risk in Northern Ireland, with the impact of fluvial flooding being significantly greater within urban and suburban areas (such as Belfast, Portadown, Derry/Londonderry and Strabane). Significant risk of surface water (pluvial) and coastal flooding also exists throughout Northern Ireland. Consideration needs to be given to such flood risks in planning for transmission infrastructure to avoid the poor siting of facilities so as they may be at risk of inundation or to cause knock on flooding to local receptors or material assets.

Air

There are 19 active Air Quality Management Areas (AQMAs) in Northern Ireland. Construction and maintenance activities associated with the development of the transmission infrastructure may lead to increased air pollution, including ambient PM_{10} and nitrogen dioxide emissions, resulting in both short- and long-term negative impacts upon air quality, climatic factors, human health and biodiversity. Further to this, there is the potential for disturbance impacts, such as dust deposition and visible plumes, as a result of ground movement and weather conditions. In some instances, this can occur at great distances from the originating site. With that being said, the potential for connecting new renewable energy generators such as wind and tidal turbines to the national grid is likely to result in a reduced dependence upon fossil fuels. This will have a positive impact upon air quality insofar as it will result in a net reduction of the number of pollutants released into the atmosphere in the medium and long term. This could have far-reaching positive consequences upon other factors such biodiversity, climate, human health and population.

Climatic Factors

The predicted impacts of climate change are likely to include hotter, drier summers and warmer, wetter winters with more extreme weather and rising sea levels. These effects of climate change are likely to increase pluvial, fluvial and coastal flooding and will require future development to be adaptable or resilient to future climatic changes and its associated impacts.

Activities associated with the development of transmission infrastructure, including manufacturing, transportation, construction, maintenance and decommissioning, may lead to increased emission of pollutants into the atmosphere, and contribute towards anthropogenic climate change. However, the government, in its Energy Strategy, has set a green energy target for at least 70% of electricity consumption from renewable sources by 2030. Progress has been made towards this target; the most recent figures[1] showing that 49.3% of electricity consumption came from indigenous renewable sources for the 12-month period October 2021 to September 2022, an increase of 7.2% from the previous 12-month period. Of all renewable energy generated within Northern Ireland in this period, 84.9% was generated from wind. Continued progress in this way, through

[1] https://www.economy-ni.gov.uk/news/electricity-consumption-and-renewable-generation-northern-ireland-year-ending-september-2022#:~:text=In%20terms%20of%20the%20volume,sources%20located%20in%20Northern%20Ireland.

the ongoing connection of renewable energy generators to the national grid, is likely to result in a reduced dependency upon fossil fuels, a net reduction in the emission of pollutants into the atmosphere, and support climate change mitigation.

Material Assets

Given the geographic scope of the TDPNI and the large-scale nature of proposed alternatives, there is the potential for transmission infrastructure development and operation to impact upon or be impacted by existing material assets. Within Northern Ireland there is approximately 25,700 km of public road, 9,700 km of footways, 5,800 bridges and 290,000 street lights. In addition to this, Northern Ireland has six designated railway routes covering a total distance of 329,855 km. Air travel infrastructure includes three main commercial airports: Belfast International Airport, City of Derry Airport and George Best Belfast City Airport. There are also 23 small commercial, private and military airfields throughout Northern Ireland. The existing electricity transmission infrastructure in Northern Ireland comprises 2,300 km of transmission network and includes 713 km of 275 kV overhead line and 1 km of cable, 934 km of 110 kV overhead line, 112 km of 110 kV cable and 8,427 substations. Northern Ireland has three fossil fuel generating plants, located at Ballylumford, Kilroot and Coolkeeragh, which sell electricity into the Single Electricity Market pool along with other generators, including renewable energy. Electricity is also supplied to this pool by Mutual Energy Limited via the Moyle interconnector. There are four existing gas transmission lines within Northern Ireland.

Cultural, Architectural & Archaeological Heritage

There are 51,820 recorded heritage assets within Northern Ireland that have been included in the Historic Environment Record of Northern Ireland (HERoNI). This includes 17,855 entries on the Sites and Monuments Record, 15,383 recorded historic buildings, 15,704 Industrial Heritage Record sites, 738 Defence Heritage Record sites, 738 Battlefield sites, 663 Historic Parks and Gardens Record sites, 340 Historic Wrecks and 399 Historic Nucleated Urban Settlements (including those with identified areas of archaeological potential). There are also over 12,000 designated heritage assets in Northern Ireland. This includes 190 Monuments in State Care, 2,014 Scheduled Historic Monuments., two Protected Wrecks, 8,976 Listed Buildings, 300 Historic Parks and Gardens of Special Historic Interest and 58 Conservation Areas. Local Landscape Policy Areas (547 no.), Areas of Significant Archaeological Interest (10 no., representing distinctive areas of the historic landscape in Northern Ireland), and Areas of Townscape / Village Character (177 no.) are LDP designations which may include assets recorded by HERoNI. There is also one UNESCO world heritage site in Northern Ireland; being the Giant's Causeway, designated for its unique geological heritage.

Landscape & Visual Amenity

Northern Ireland comprises a wide variety of different landscapes, including river valleys, drumlin hills, lakelands, raised bogs and rolling farmlands, to name a few. The value of Northern Ireland landscape is recognised through the designation of eight areas as Areas of Outstanding Natural Beauty (AONB), making up c. 20% of its total land area. The Giant's Causeway UNESCO WHS is designated for its unique geological heritage. There are two UNESCO Global Geoparks located in Northern Ireland, one is the Mourne, Gullion, Strangford UNESCO Global Geopark and the other is the Cuilcagh Lakelands UNESCO Global Geopark, formerly Marble Arch Caves UNESCO Global Geopark, which is a transnational geopark that straddles the border between Fermanagh in Northern Ireland and Cavan in the Republic of Ireland. These Geoparks are areas of internationally important rocks and landscapes. There are eight NIEA Country Parks and 56 National Trust Sites in Northern Ireland.

The overall landscape has been designated into 130 Landscape Character Areas and into 24 Seascape Character Areas. The Northern Ireland Landscape Character Assessment 2000 identifies six distinctive landscapes. Within these areas, and throughout Northern Ireland, there are a wide variety of Tourism Conservation Zones, Local Landscape Policy Areas, Areas of Scenic Quality / Areas of High Scenic Value and Areas of Village Character. The Northern Ireland Regional Landscape Character Assessment (NIRLCA), developed in 2016, aimed to complement the NILCA by providing subdividing the countryside into 26 Regional Character Areas (RCAs), based upon with the aim to provide information on which to base plans at a more local level that might affect landscape character.

Evolution of the Environment in the Absence of the TDPNI

The evolution of the environment in the absence of the TDPNI was assessed in the SEA Environmental Report, i.e., the Do-Nothing Scenario. In the absence of the TDPNI there would be no overarching strategic planning of transmission infrastructure, and therefore the construction and maintenance of transmission infrastructure will take place in a more ad hoc manner. There is likely to be less transmission development and maintenance under the Do-Nothing scenario. The projects that go ahead may not strategically be the best projects to be pursued and may not be the most sustainable.

Review of Relevant Plans, Programmes and Policies

A review of the Plans, Policies and Programmes relevant to the TDPNI was carried out at International, European, National, Regional and Sub-Regional scales in **Section 4**. This exercise was carried out with a view to establish the context of the draft TDPNI, with regard to other Plans and Programmes. In particular, the environmental protection objectives (EPO's) and standards included within these Plans and Programmes that will directly influence, or be influenced by, the draft TDPNI requires consideration.

Assessment Methodology

The TDPNI has been developed to ensure future requirements of the electrical network in Northern Ireland will be met. This SEA Environmental Report has been produced to assess the environmental impacts of the various development options (alternatives) within the TDPNI and to provide the environmental guidance to help create a more sustainable TDPNI. In parallel to this, a Habitats Regulation Assessment (HRA) has been prepared to inform the decision-making process, in terms of the potential for the development options to impact the integrity of any European sites in view of that site's conservation objectives. Both environmental assessments have been central to the development of the draft TDPNI.

The TDPNI has been assessed via a Baseline Led Assessment. This method involves the assessment of each option available in the potential developments of the TDPNI against each of the following topics:

- Biodiversity, Flora & Fauna (BFF)
- Population & Human Health (PHH)
- Geology, Soils & Land use (GSL)
- Water (W)
- Air (A)
- Climatic Factors (CF)
- Material Assets (MA)
- Cultural, Architectural & Archaeological Heritage (CH)
- Landscape & Visual Amenity (L)

To simplify the assessment process and avoid repetition during assessment of each potential option, the potential project types (e.g., overhead transmission lines, underground cables, substations) were first assessed at a high level for their potential effects against SEOs.

Following this high-level assessment of generic project types, each potential option / project in the TDPNI has been assessed in the short-, medium- and long-term for likely effects, the significance of the effects, and whether they are positive or negative effects. Other impacts that have been assessed for significance are secondary effects, cumulative effects, synergistic effects, temporary and permanent effects, and the inter-relationship of effects. The scenario of "The Evolution of the Environment without the Plan" has also been assessed in the same format. This is considered the Do-Nothing Scenario.

The options available to the TDPNI have been assessed in terms of their potential effects, and the significance of these effects, on the environment against a set of strategic environmental objectives (SEOs). These SEOs were developed in the context of broader environmental protection objectives set at both international and

national level (outlined in **Section 4** and detailed in **Appendix B**), and also took into account the context of potential for effects associated with the TDPNI. The SEOs, Sub-Objectives, Indicators and Targets used are given in **Table 0-2**. The assessment examined the likely significant effects of the proposed options comprising the draft TDPNI, and how their implementation could contribute to achieving these SEOs.

The environmental assessment of each potential option included within the TDPNI 2023-2032 has initially focused within an appropriate geographic study area. The intention in setting a study area for each potential option was to enable a focus on the potential environmental issues and sensitivities that could be affected by the project. This study area is of sufficient size to include all potential areas within which the proposed infrastructure comprising that option could be developed. The study area set for an option comprising a new transmission line is therefore much larger than that for an option comprising a new substation. Potential options that comprise upgrading works and asset replacement have a more focussed study area again, as these will be geographically limited to the location of existing infrastructure.

Environmental constraint modelling for the TPDNI was developed bespoke for the study and was undertaken using ArcGIS Spatial Analyst. The environmental indicators (sensitivities and constraints) used in this modelling, along with a brief description and their relative scoring is provided in **Table 5-5**. For each development option the output constraints map demonstrates the overall sensitivity in that potential area for transmission infrastructure. The least cost environmental corridors (areas within 1% of the best environmental line) demonstrate the areas of lowest sensitivity, based on the parameters used, to develop the transmission infrastructure. Geographical buffers were applied to the proposed data, based on the findings of the EirGrid Evidence Based Studies, to minimise risks to sensitive receptors.

Table 0-2 Strategic Environmental Objectives

SEA Topic	Objective		Sub-Objective(s)		Indicators	Target(s)
Biodiversity, Flora & Fauna	**1**	Avoid damage to, and where possible enhance, biodiversity, flora and fauna.	**A**	Preserve, protect, maintain and, where possible, enhance internationally protected species and habitats.	• Conservation condition of designated habitats and species within International / European sites (SACs, SPAs, Ramsar sites).	• No negative change, or a positive change, in the conservation status of designated habitats and species within International / European sites.
			B	Preserve, protect, maintain and, where possible, enhance national and local nature conservation sites, protected habitats and species, and other known species of conservation concern.	• Status of designated habitats and species within national and local sites. • Status of protected and priority habitats and species.	• No negative change, or a positive change, in the conservation status of designated habitats and species within national and local sites. • No negative change, or a positive change, in the status of protected or priority species and habitats outside of designated sites.
Population & Human Health	**2**	Minimise the risk to, and provide benefit for, the community and human health.	**A**	Minimise disruption and displacement to the local population, while providing robust transmission infrastructure.	• Population density within proximity to potential transmission system developments.	• Low population density within proximity to transmission system developments.
			B	Minimise risks to human health and social deprivation, while providing robust transmission infrastructure.	• Perceived health of the local population within proximity to potential transmission	• No negative change, or a positive change, in the health of the population within proximity to transmission system developments.

					system developments. • Socially sensitive areas within proximity to potential transmission system developments.	• No socially sensitive areas within proximity to transmission system developments.
Geology, Soils and Landuse	**3**	Minimise damage to the function and quality of the soil resource in the study area in construction and operation of transmission infrastructure.	**A**	Minimise damage to the function and quality of the soil resource in the study area in construction and operation of transmission infrastructure.	• Loss or damage to protected geological / geomorphological features within international or national designated sites (UNESCO Geoparks, ASSIs). • Loss or damage to sensitive soils and land uses, e.g., peatlands, ancient woodland, commercial forestry, cultivated lands. • Interactions with potentially hazardous soils and activities, e.g., PPC sites, mines, quarries, historically contaminated sites. • Interactions with topographically difficult sites, e.g., steep slopes and uplands.	• No effects on protected geological / geomorphological features within international or national designated sites (UNESCO Geoparks, ASSIs). • No loss of, or damage to, sensitive soils and land uses. • No interaction with hazardous sites and topographically unsuitable areas.
Water	**4**	Avoid impacts on the status or quality of water bodies and avoid interaction with areas of flood risk.	**A**	Support the objectives of the WFD and Marine Strategy by avoiding damage to or deterioration of water status, quality and resource.	• WFD status of surface, coastal, transitional and groundwater bodies within proximity to potential transmission system developments. • Status of sensitive waterbodies, e.g., drinking and bathing waters within proximity to potential transmission system developments.	• No negative change, or a positive change, in the status of surface water and groundwater bodies, including sensitive water bodies, and potential to contribute to the achievement of water body objectives under the WFD. • No deterioration in the status of NI seas, and potential to contribute to the achievement of Good Environmental Status (GES) under the MSFD.
			B	Support the objectives of the Floods Directive by avoiding interactions	• Medium probability flood extents - Pluvial and fluvial 100-year and	• No interaction with areas of flood risk.

				with coastal, pluvial or fluvial flood extents.	coastal 200-year flood extents.	
Air	**5**	Minimise risk to local air quality and contribute to improving regional emissions.	**A**	Minimise risk to local air quality and contribute to improving regional emissions.	• Development in air quality sensitive areas. • Enable increased renewable energy connection to reduce requirements for fossil fuel burning.	• No transmission system developments within air quality sensitive areas. • Number of transmission system developments that may facilitate increased renewable energy connection.
Climatic Factors	**6**	Adaption of infrastructure to potential climatic change and reduction of GHG emissions from the energy supply sector in line with national commitments.	**A**	Adaption of infrastructure to potential climatic change.	• Medium probability climate change (cc) influenced flood extents - Pluvial and fluvial 100 year + cc and coastal 200 year +cc flood extents.	• No transmission system developments within areas of climate change flood risk, unless resilient to flooding.
			B	Contribute to a reduction in GHG emissions from the energy supply sector in line with national commitments.	• Enable increased renewable energy connection to reduce requirements for fossil fuel burning.	• Number of transmission system developments that may facilitate increased renewable energy connection.
Material Assets & Infrastructure	**7**	Provide new, robust electrical transmission infrastructure with minimal disruption to other assets and infrastructure.	**A**	Provide new, robust electrical transmission infrastructure with minimal disruption to other assets and infrastructure.	• Transmission infrastructure developed or upgraded. • Potential for impacts on transport (road, rail, air) and energy infrastructure (gas). • Potential for loss of or impacts to agricultural land assets.	• Number of transmission system developments developed or upgraded. • No disruption to transport and energy infrastructure. • No loss of agricultural land assets.
Cultural, Architectural & Archaeological Heritage	**8**	Protect, conserve, and enhance the historic environment and cultural heritage.	**A**	Protect International, National and Local Heritage Designations, and areas of heritage potential, and their settings.	• Potential for impacts on archaeological heritage features or their setting. • Potential for impacts on architectural heritage features or their setting. • Discovery of previously unknown archaeological heritage features.	• No negative change, or a positive change in the condition or setting of international, national and local heritage designations, in development and operation of infrastructure. • All new archaeological discoveries are reported in line with legislative requirements.

Landscape / Seascape & Visual Amenity	**9**	Minimise the potential for negative impacts on the character and quality of landscapes / seascapes or visual amenity.	**A**	Minimise the potential for negative impacts on the character and quality of landscapes / seascapes or visual amenity.	• Landscape / seascape sensitivity to infrastructure development. • Potential for impacts on visually sensitive areas, such as AONBs and country parks.	• No negative change, or a positive change, in visual amenity or landscape / seascape character, in development and operation of infrastructure.

Environmental Assessment of the TDPNI and Conclusions

Strategic Alternatives Assessment

The SEA process must include an evaluation of the likely environmental consequences of a range of reasonable alternative scenarios, which in this case are alternatives to the draft TDPNI. The following strategic-level alternatives were considered for the draft TDPNI 2023-2032:

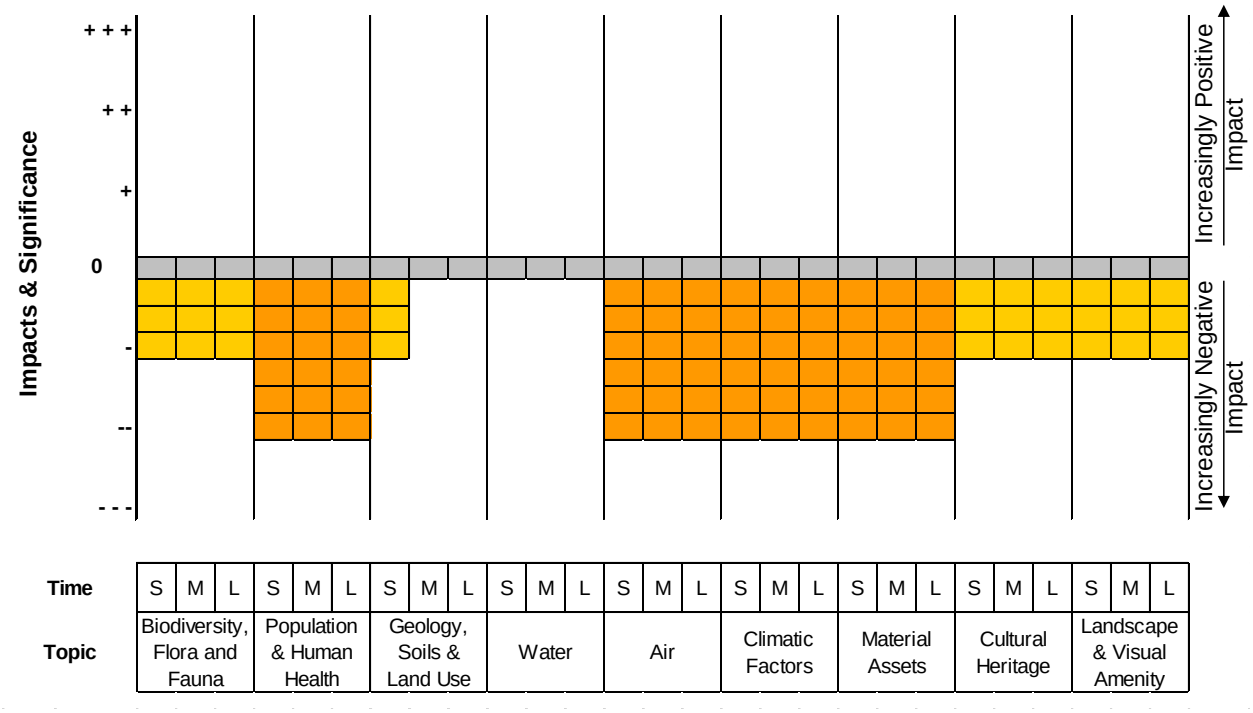
- Alternative 1 – No Plan option: strategic development occurs in an ad hoc manner (essentially a 'Do-Nothing' scenario from a plan making and SEA perspective).

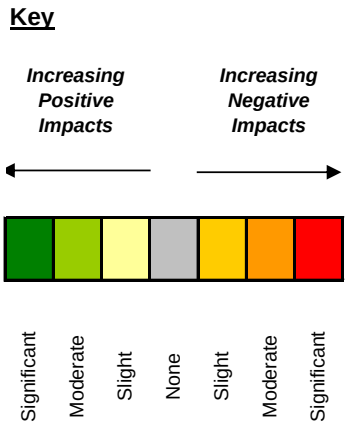
- Alternative 2 – Strategy option: no new Plan for the period 2023-2032 but reference to provisions of the existing TDPNI 2018-2027. Note that while this can be considered by the SEA process as a potential strategic alternative, in practice it would be complicated by the commencement of projects since the existing plan was published in addition to changes in likely project costs, etc.

- Alternative 3 – Preparation and adherence to the specific policies and objectives for development as set out in the TDPNI 2023-2032.

In the case of Alternative 1, individual projects may be progressed without strategic level planning. There is the potential for neutral to significant negative impacts on the SEOs for Biodiversity, Flora, and Fauna; neutral to significant negative impacts to the SEOs for Population and Human Health in the short- to long-term; neutral to moderate effects on the SEO for Geology, Soils and Land use; slight to moderate negative impacts on the SEOs for Water; neutral to significant negative impacts on the SEO for Cultural Heritage; and neutral to significant negative impacts on the SEO for Landscape and Visual Amenity; with the significance of impacts depending on the connectivity of future transmission development projects with sensitive sites and areas. There is the potential for short-term impacts on local air quality and GHG emissions with negative impacts on SEOs for Air and Climatic Factors; however, there is also the potential for medium- and long-term detrimental impacts upon these SEOs within Northern Ireland, because an ad hoc approach may result in less connection of renewable energy sources to the electricity supply network. There are unlikely to be any short-term impacts on the Material Assets SEO; however, in the medium- to long-term, there is the potential for an ad hoc approach to result in electricity supply shortages in parts of Northern Ireland.

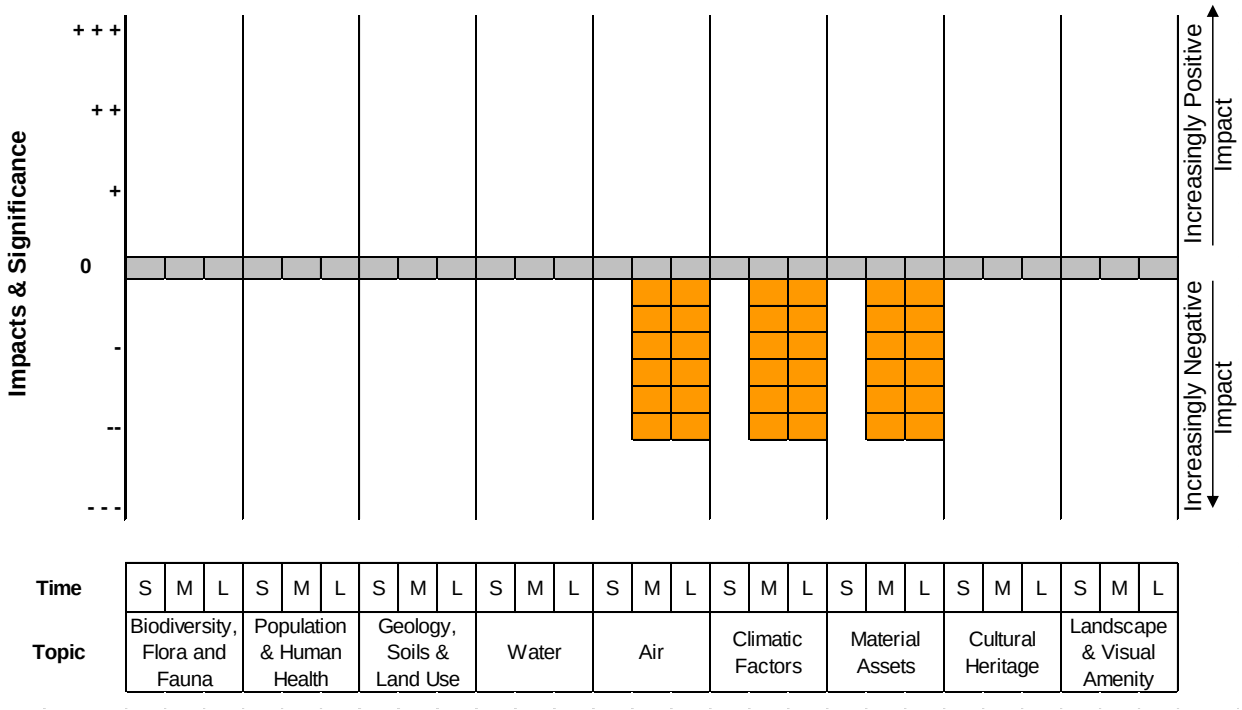
In comparison to the draft TDPNI 2023-2032, there is likely to be the potential for slight, short- to long-term negative impacts on Biodiversity, Flora and Fauna, slight short-term negative impacts on Geology, Soils and Land use, and slight short- to long-term negative impacts on Cultural Heritage and Landscape and Visual Amenity. There is also the potential for slight to moderate, negative impacts on Population and Human Health, Air, Climatic Factors and Material Assets in the short- to long-term from this strategic alternative.





In the case of Alternative 2, some projects may still progress to development, that were included in this iteration of the plan, with the potential for positive and negative impacts on SEOs as established in the SEA Environmental Report that was published to accompany that plan. There is the potential for medium- and long-term detrimental impacts upon the SEOs for Air and Climatic Factors, as an ad hoc approach moving forward may result in less connections of renewable energy sources to the electricity supply network. Likewise, in the medium- to long-term, there is the potential for an ad hoc approach to result in electricity supply shortages in parts of Northern Ireland, with the potential for negative impacts on the SEO for Material Assets in the medium- to long-term.

In comparison to the draft TDPNI 2023-2032, there is likely to be the potential for slight to moderate negative impacts on Air, Climatic Factors and Material Assets in the medium- to long-term from this strategic alternative.



The assessment of implementing the draft TDPNI for 2023-2032, i.e., Strategic Alternative No.3, has been undertaken in detail in **Section 7**. There is the potential for short- to long-term impacts across all SEOs from the implementation of the TDPNI for 2023-2032. However, the overarching policies and objectives set out in the plan would continue to provide protection to the environment at a strategic level. The policy and objective for biodiversity that are new to this iteration of the plan would also apply[2], with the potential for long-term positive effects on the SEOs for Biodiversity, Flora and Fauna. Furthermore, the future implementation of projects arising from the TDPNI would have regard for the assessment outcomes from the SEA process, and the mitigation measures outlined, in ensuring that the environment is protected during project level planning and development.

Plan Proposals Assessment

The various options / alternatives available to the TDPNI have all been subject to a quantitative and qualitative assessment in terms of their potential effects, and the significance of these effects, on the environment against the SEOs in **Section 7**. This will allow for a comparison between the relative merits and drawbacks of the projects proposed by the TDPNI 2023-2032.

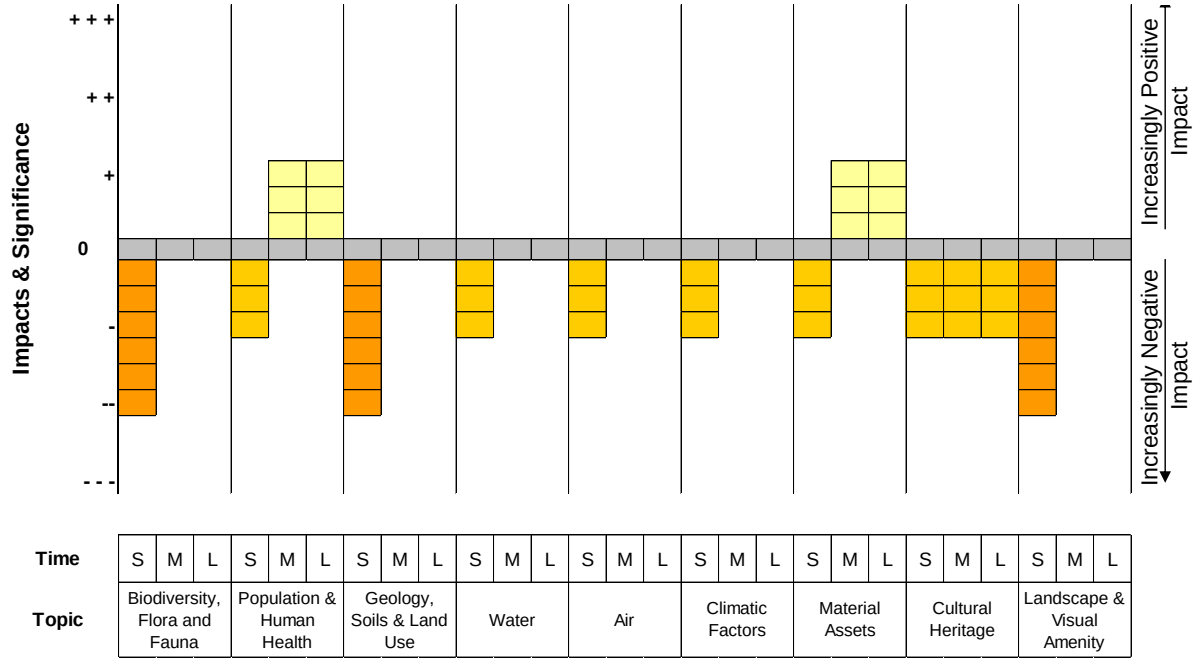
1. Moyle Interconnector Capacity Increase

The installation of two 275 kV cables from Ballycronan More to Ballylumford has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short-term employment opportunities from construction of the new line (+1). There is the potential for short-term, temporary, construction phase, slight to

[2] ENVP5* To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland. ENVO2* To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5.

moderate impacts on Geology, Soils, and Land use due to interactions with potentially hazardous land use (-2). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, slight negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on five European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

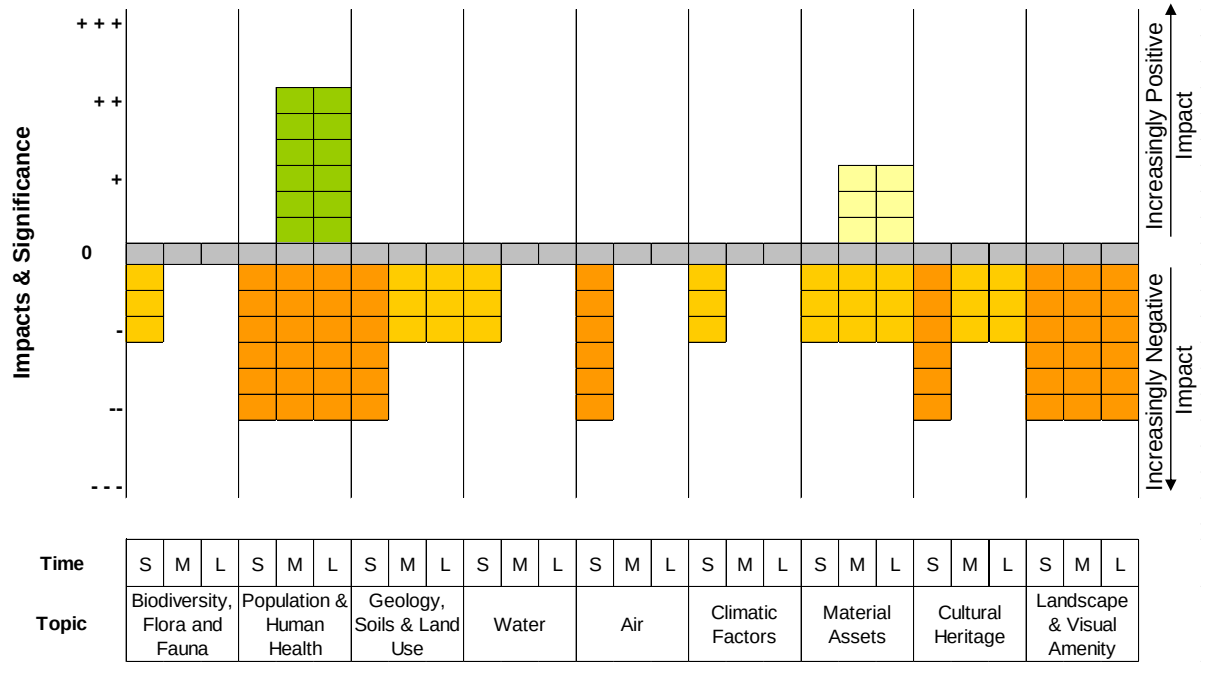


2. Armagh and Drumnakelly Reinforcement

Development of a new substation at Armagh, and new transmission lines connecting to Tandragee has the potential for short-term, temporary, construction phase, slight negative impacts on protected species due to potential hydrological connectivity (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to slight to moderate improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and

operation of the new line (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation and OHL structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including in a sensitive area (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight potential for medium- or long-term impacts on these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

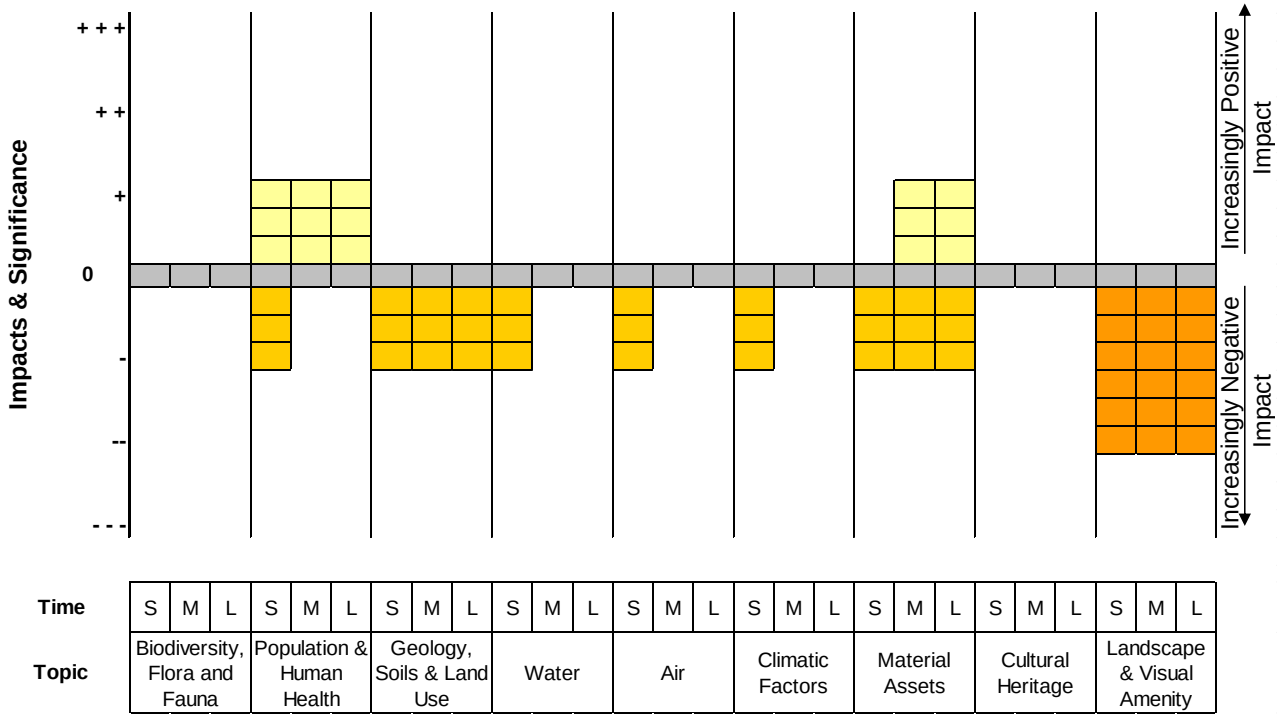


3. East Tyrone Reinforcement

Development of the Dungannon substation extension has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the

potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation extension (+1). There is the potential for short-, medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts on Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

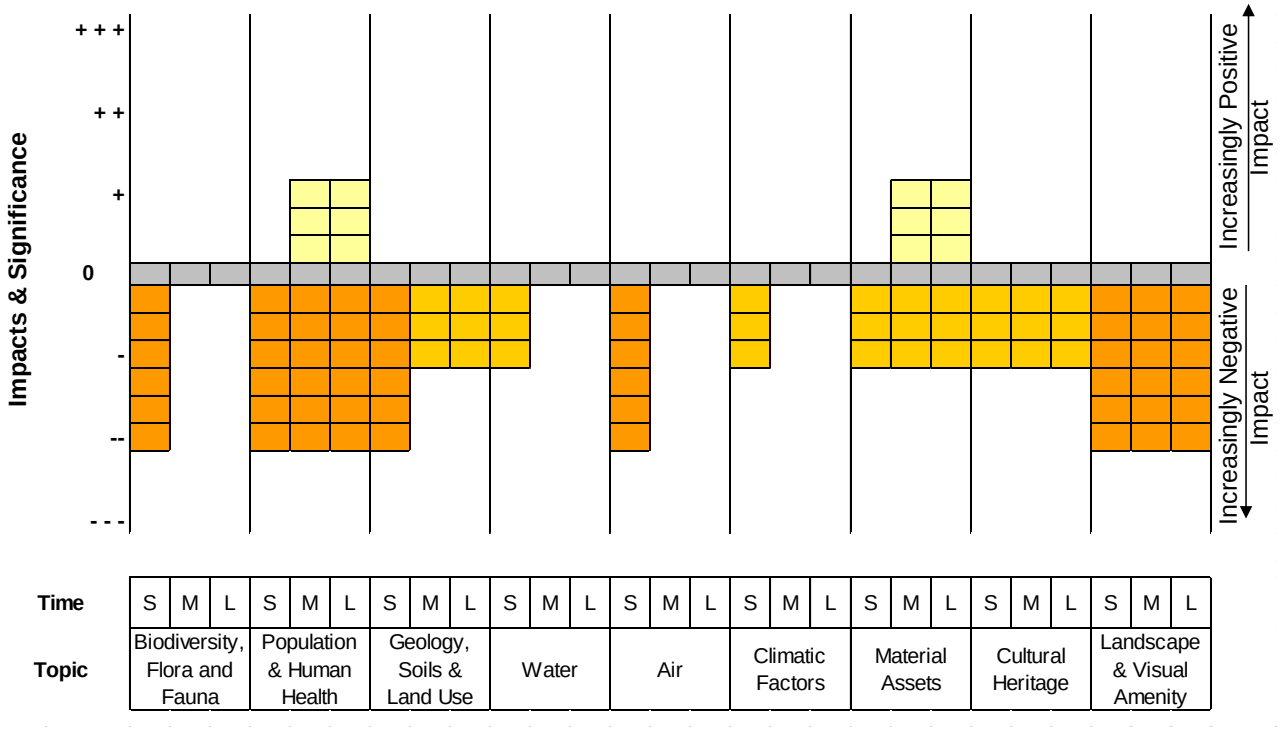


4. Newry Reinforcement

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

Development of the Newry substation and uprating of the OHL to Tandragee has the potential for short-term construction phase, slight to moderate, indirect negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national, and local designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight

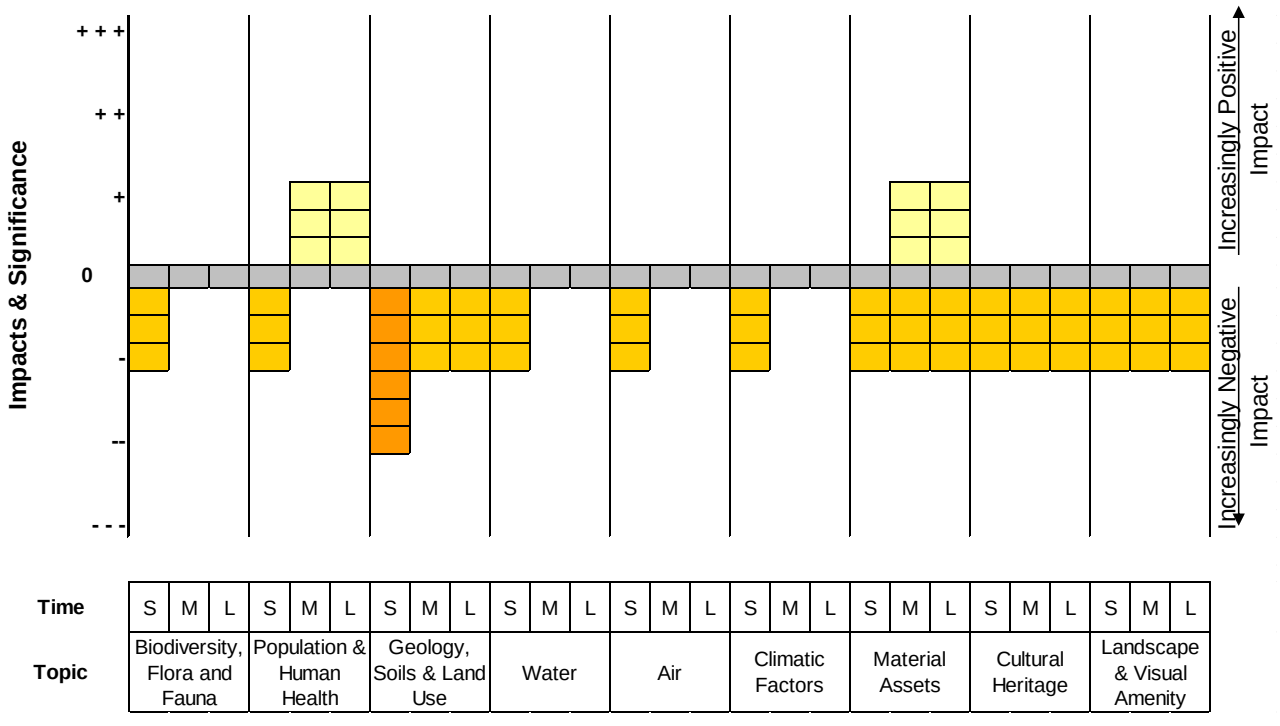
negative disturbance impacts on Population and Human Health, including in socially sensitive areas (-2), and medium- to long-term negative effects from the presence of new infrastructure in these high population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including in sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).



Option B: Construction of a new substation near Newtownhamilton.

Development of the new substation at Newtownhamilton has the potential for short-term, temporary, construction phase, slight negative impacts on Biodiversity Flora and Fauna, including to one Salmonid River (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human

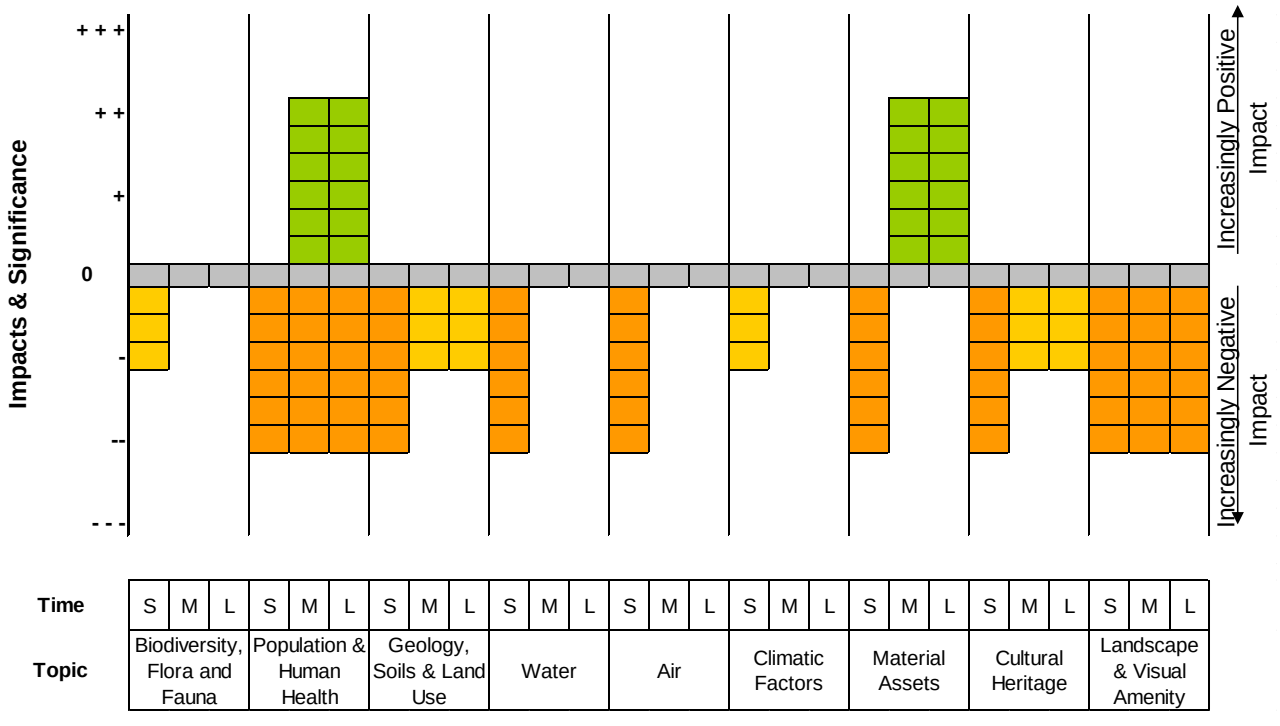
Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, slight negative impacts on Landscape and Visual Amenity, including within a non-sensitive LCA (-1).



Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

Development of the new distribution OHL has the potential for short-term, temporary, construction phase, slight negative impacts on Biodiversity Flora and Fauna, including to Salmonid Rivers (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to slight to moderate improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new line (+1). There is the potential for short-

term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the OHL structures (-1).There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase, on water quality (-1), and associated with flood risk areas (-2); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including in sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, slight to moderate negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-2); in the medium- and long-term there is potential for slight to moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for slight, medium- or long-term impacts on these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs from the new line development (-2).



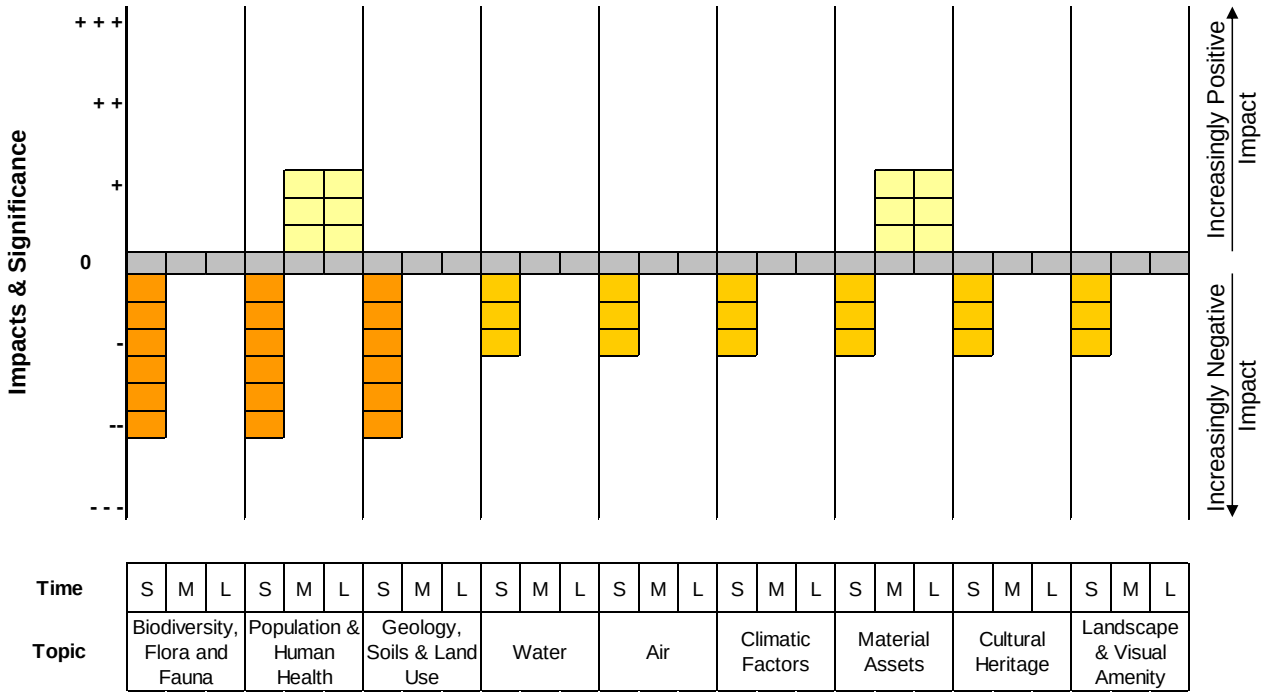
The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on eight European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

5. Coolkeeragh – Limavady – Coleraine 110 kV Uprating

Development of the 110 kV restring of all existing overhead lines between Coolkeeragh, Limavady and Coleraine has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to

international, national or locally protected areas and species within the study area following the restring. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population areas and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the restring, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail and existing electricity transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following the restring. There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within an AONB, Country Park, and sensitive LCA (-1); there are unlikely to be any further medium or long term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting.

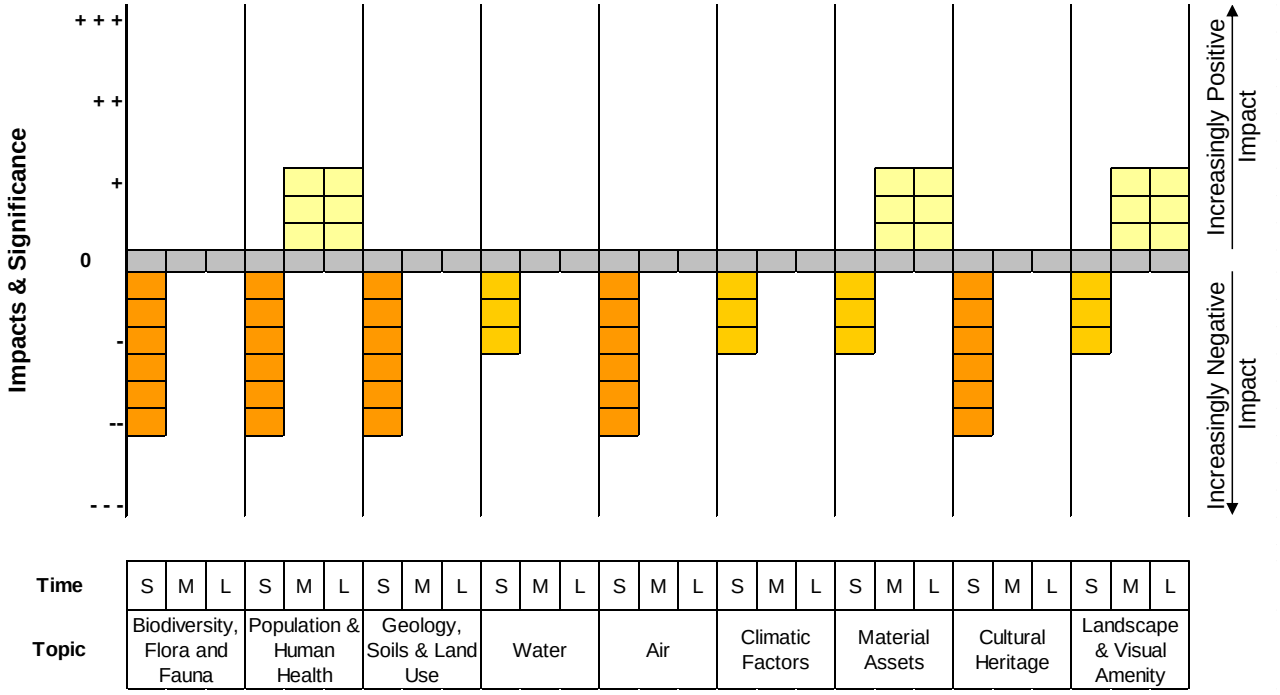
The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on four European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.



6. Drumnakelly – Tamnamore 110 kV Uprating

Development of the 110 kV restring of existing overhead lines between Drumnakelly and Tamnammore, and undergrounding of the overhead line through Killyman village, has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring and underground cabling (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the restring and underground cabling, including within sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring and underground cabling from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail, agricultural land, and existing electricity transmission infrastructure during the restring and underground cabling (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1), and for direct, temporary to permanent, impacts on a small number of features during the undergrounding of cables on the setting of these features (-2); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within a National Trust land, and sensitive LCA (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting. The undergrounding of the line through Killyman has the potential for positive impacts on the landscape and visual amenity of these areas in the medium- to long-term (+1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

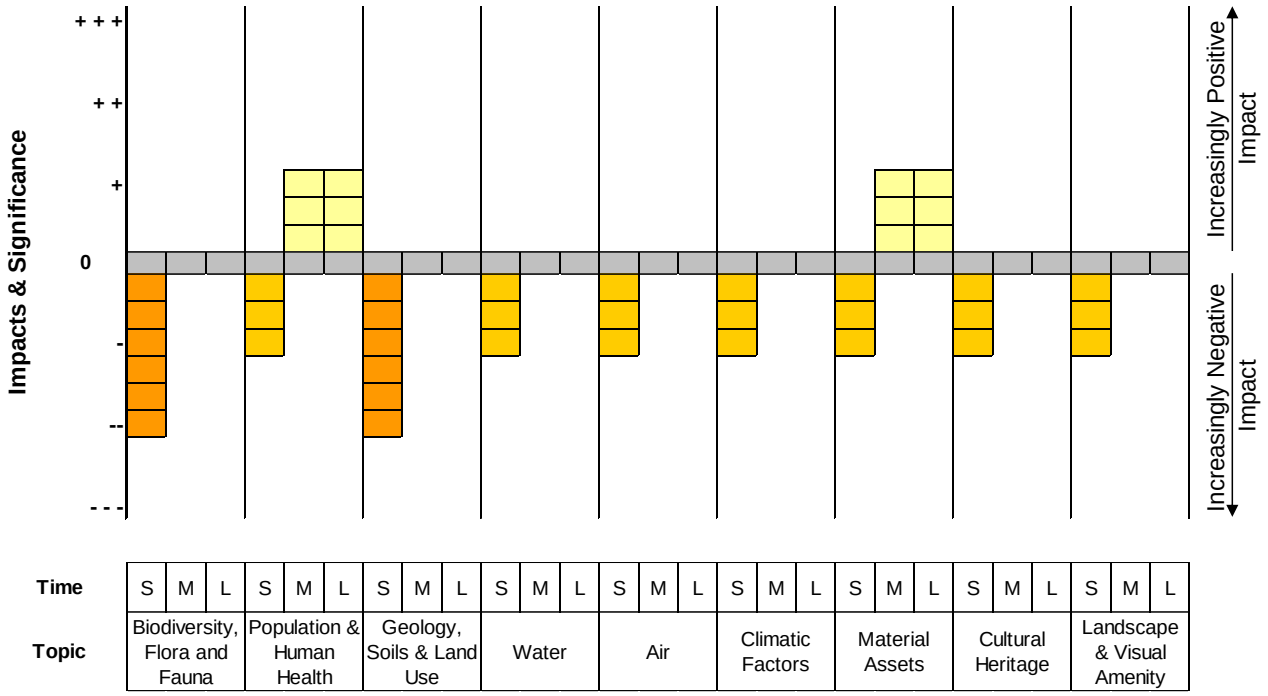


7. Ballylumford – Ballyvallagh – Uprating

Development of the restring of existing overhead lines between Ballylumford and Ballyvallagh has the potential for short-term, temporary, construction phase, slight to moderate indirect negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on the local Population and Human Health, not within high population density of social sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the restring, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are

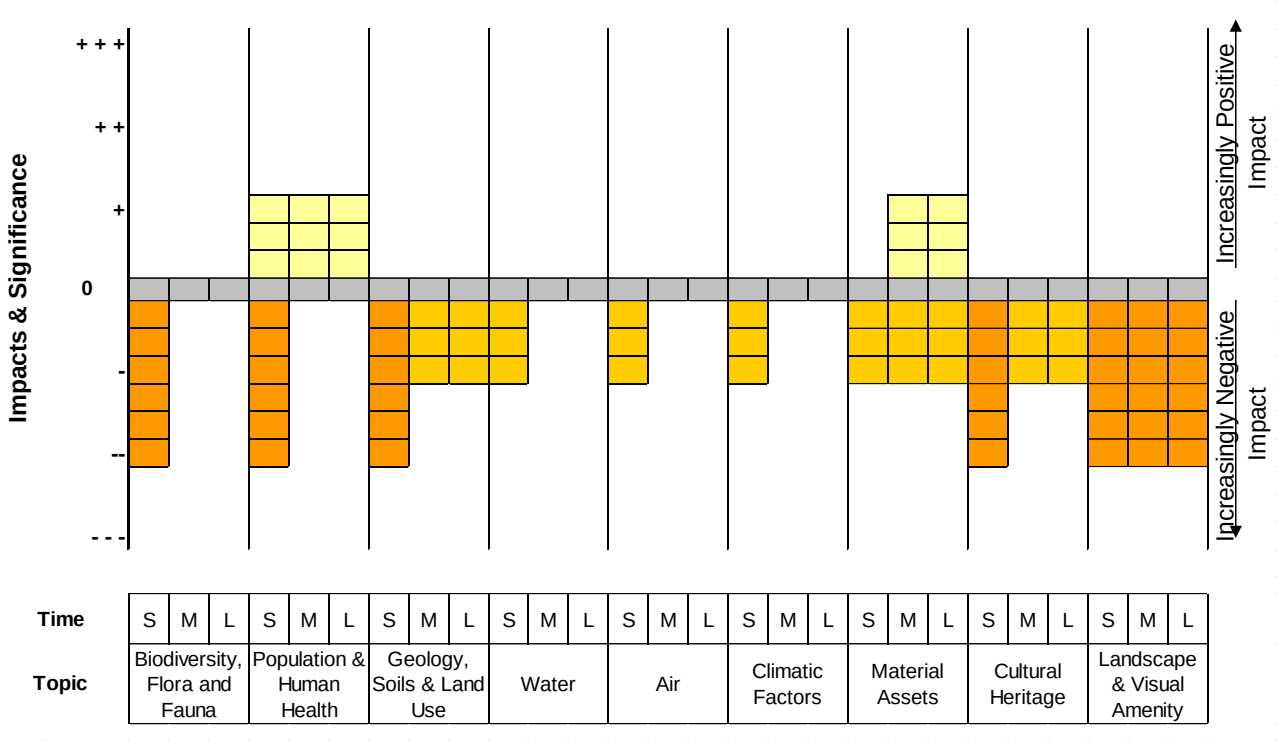
considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.



8. New NW 110 kV Switching Station

Development of the new NW Switching Station has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, including in a higher population density settlement area in (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the station (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any significant impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight to moderate, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight potential for medium- or long-term impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

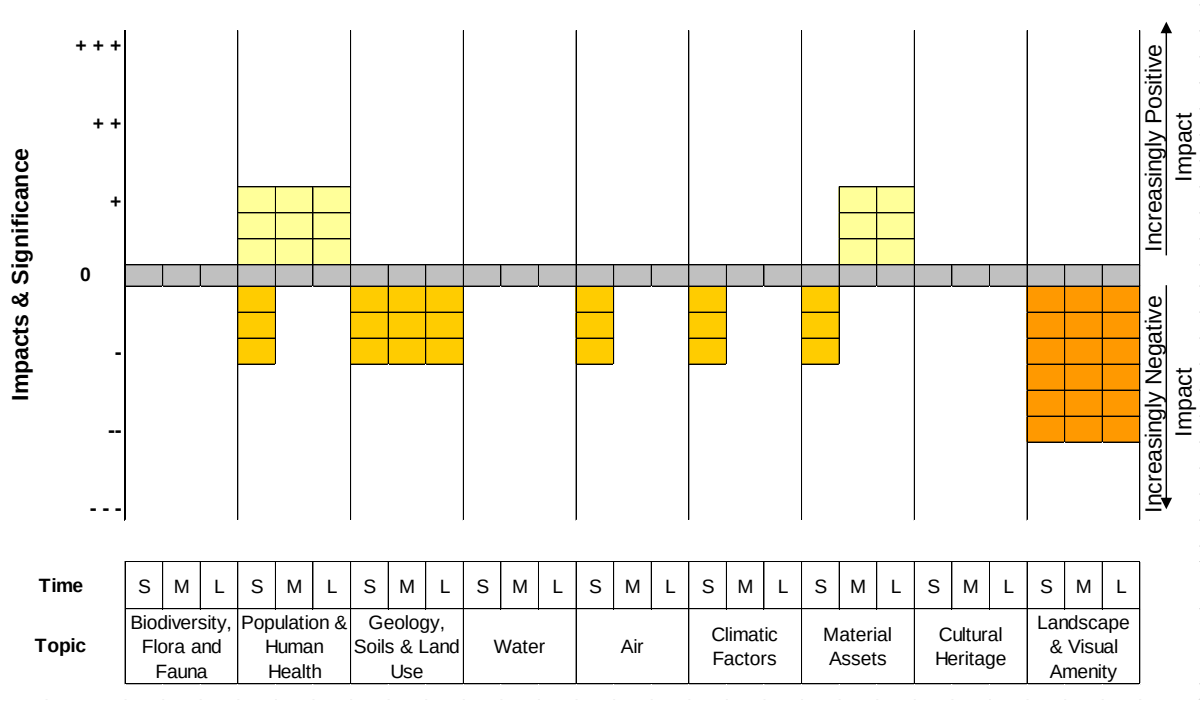
The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.



9. Coolkeeragh 110 kV Extension

Development of the Coolkeeragh 110 kV substation extension has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in a low-density population area (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the station (+1). There is the potential for short-, medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses (-1). There is unlikely to be any potential for short, medium-, or long-term impacts on Water status, resource or significant interaction with flood risk areas (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, slight negative impacts on Material Assets owing to potential interactions with existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts on Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

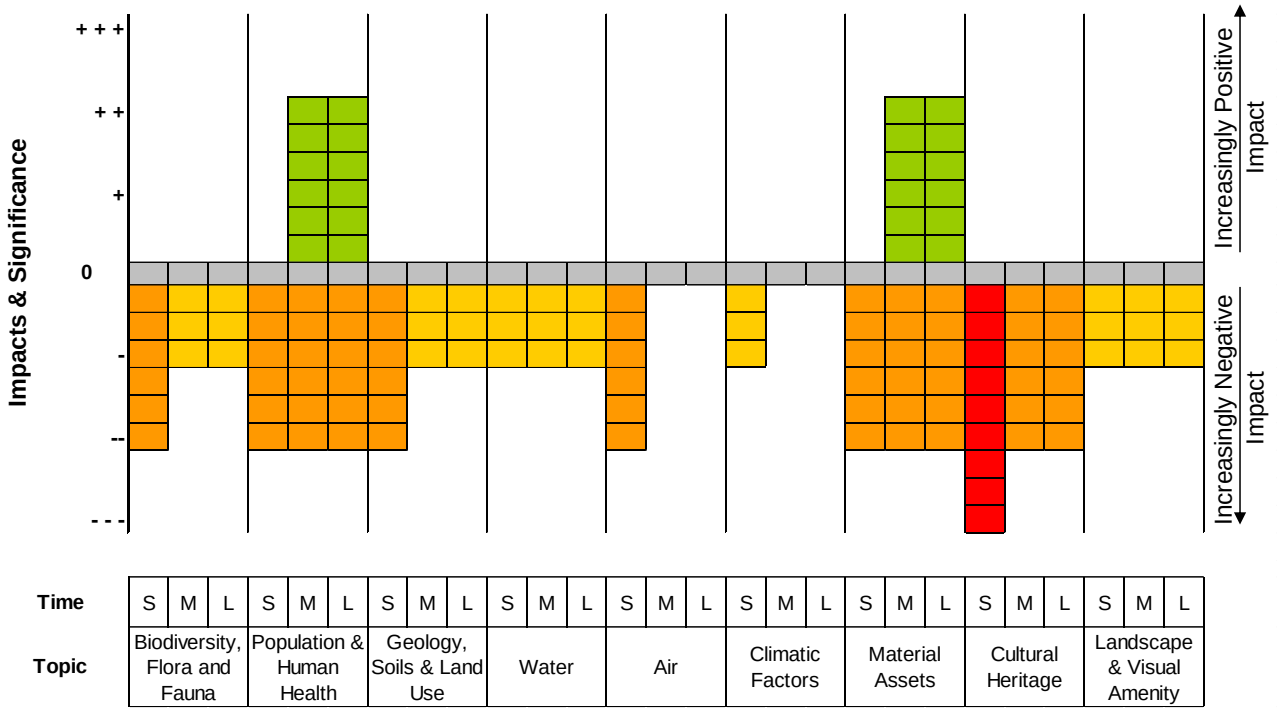
The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.



10. Energising Belfast

Development of new cables and substations in Belfast city centre has the potential for short-term, temporary, construction phase impacts on international, national, and local designated sites and Salmonid Rivers (-2), to long-term permanent, direct and indirect impacts on local designated sites (-1). There is the potential for short-term, temporary, construction phase, moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+2). There is the potential for short-term, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2) during the construction phase, and medium-, and long-term, slight permanent loss of soils and existing land use in a primarily urban area (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with numerous flood risk areas in the medium- to long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including in sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent moderate negative impacts on Material Assets owing to potential interactions with road, rail, agricultural land, and existing transmission infrastructure (-2); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to significant, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-3), and moderate potential for medium- or long-term impacts on these heritage features, or their setting, within the study area, following these works (-2). There is the potential for short-term, construction phase, to long-term permanent, negative impacts on Landscape and Visual Amenity, including within a medium to high sensitivity LCA, however impacts from new substations and underground cabling are expected to be slight owing to the existing urban setting (-1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

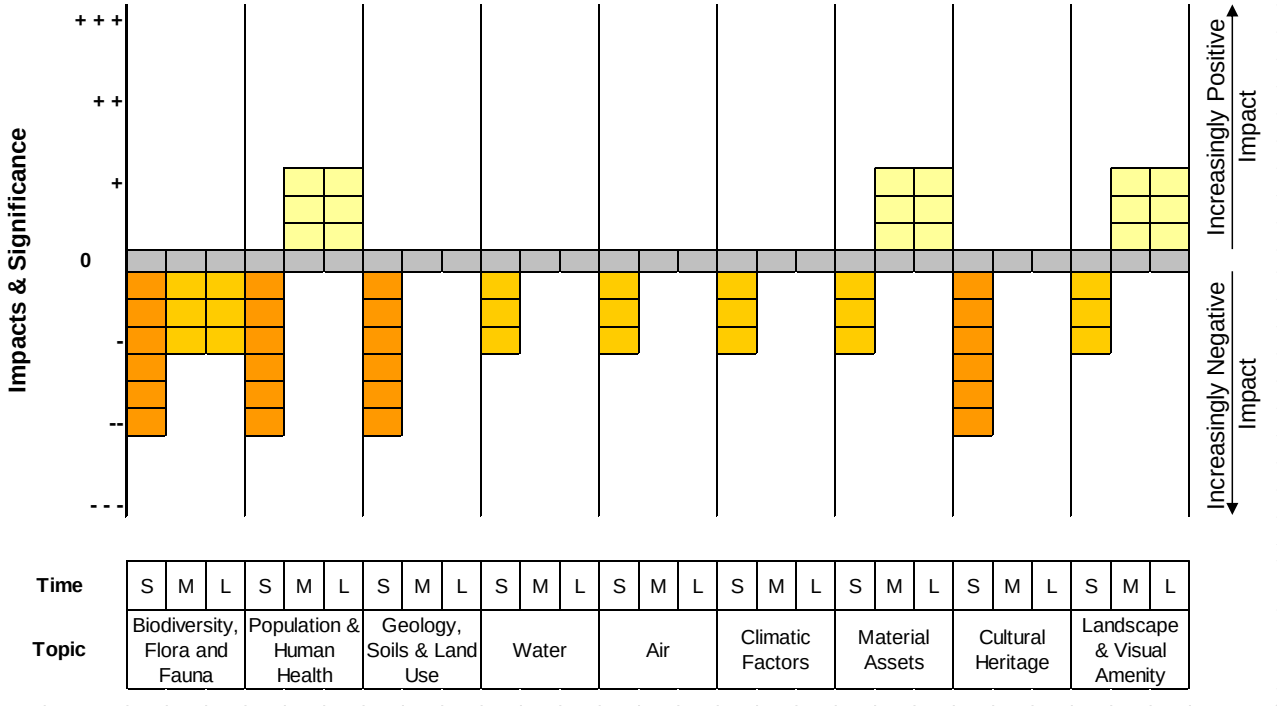


11. Eden – Carnmoney Reinforcement

Development of the Eden - Carnmoney, comprising the undergrounding of cables in Carnmoney and Carrickfergus and the uprating of OHL in the rural area between these settlement aeras, has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including indirect impacts to international and national designated sites, and for short- to long-term, direct or indirect impacts on local designated sites and Salmonid Rivers (-1). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including direct soil loss, and potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the restring, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term,

temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting. The undergrounding of the line through Carnmoney and Carrickfergus has the potential for positive impacts on the landscape and visual amenity of these areas in the medium- to long-term (+1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

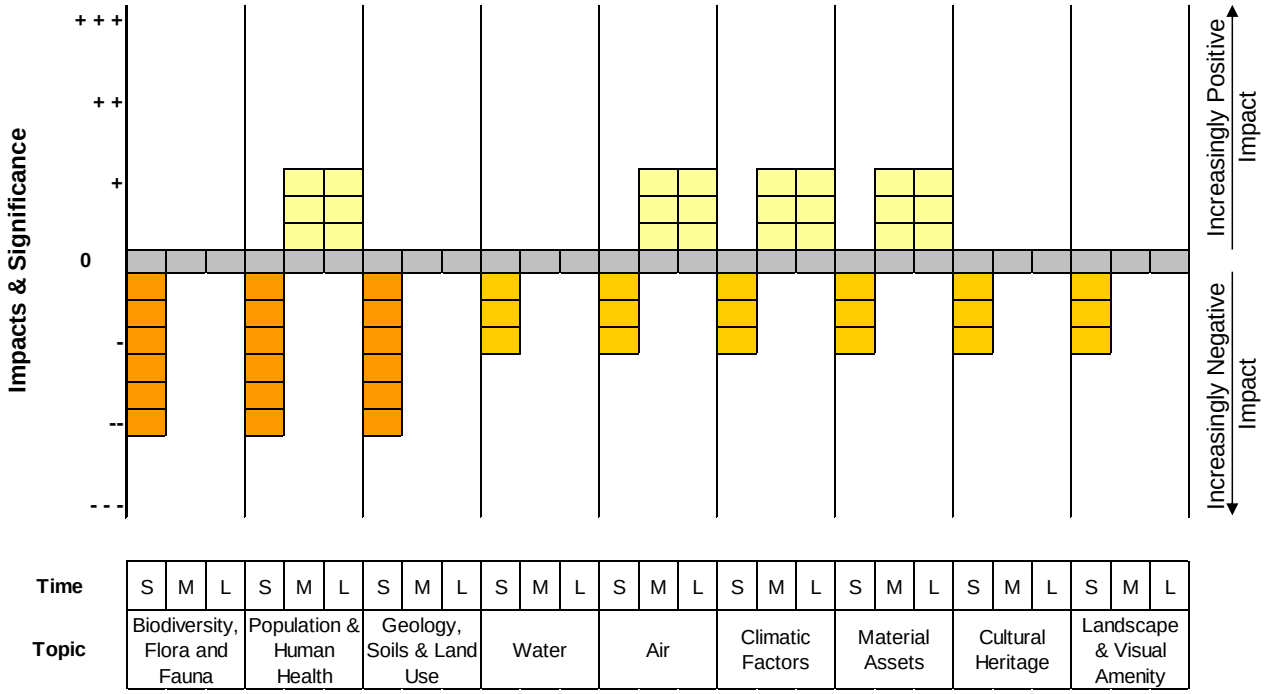


12. Coolkeeragh – Killymallaght – Strabane 110 kV Uprating

Development of the restring of existing 110 kV overhead lines between Coolkeeragh, Killymallaght, and Strabane has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in

non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within an AONB and sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on four European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

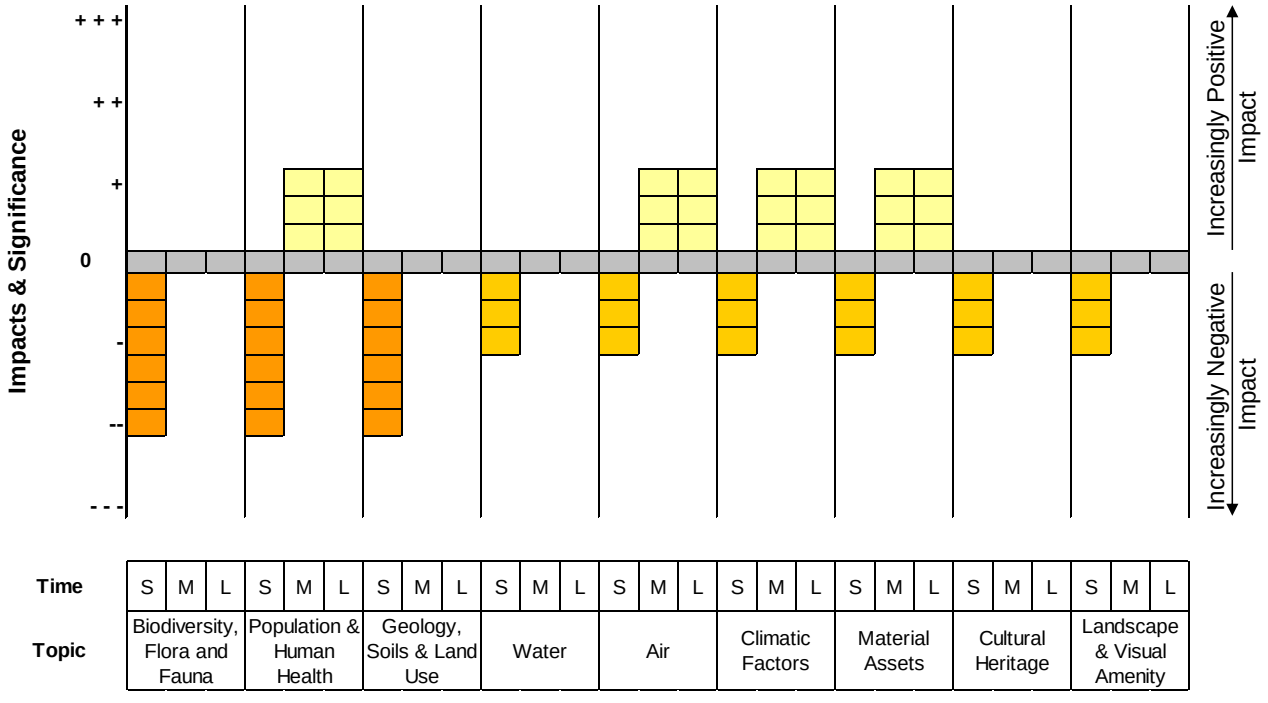


13. Omagh – Strabane 110 kV Uprating

Development of the restring of existing 110 kV overhead lines between Omagh and Strabane has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites, and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements

to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within an AONB and sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

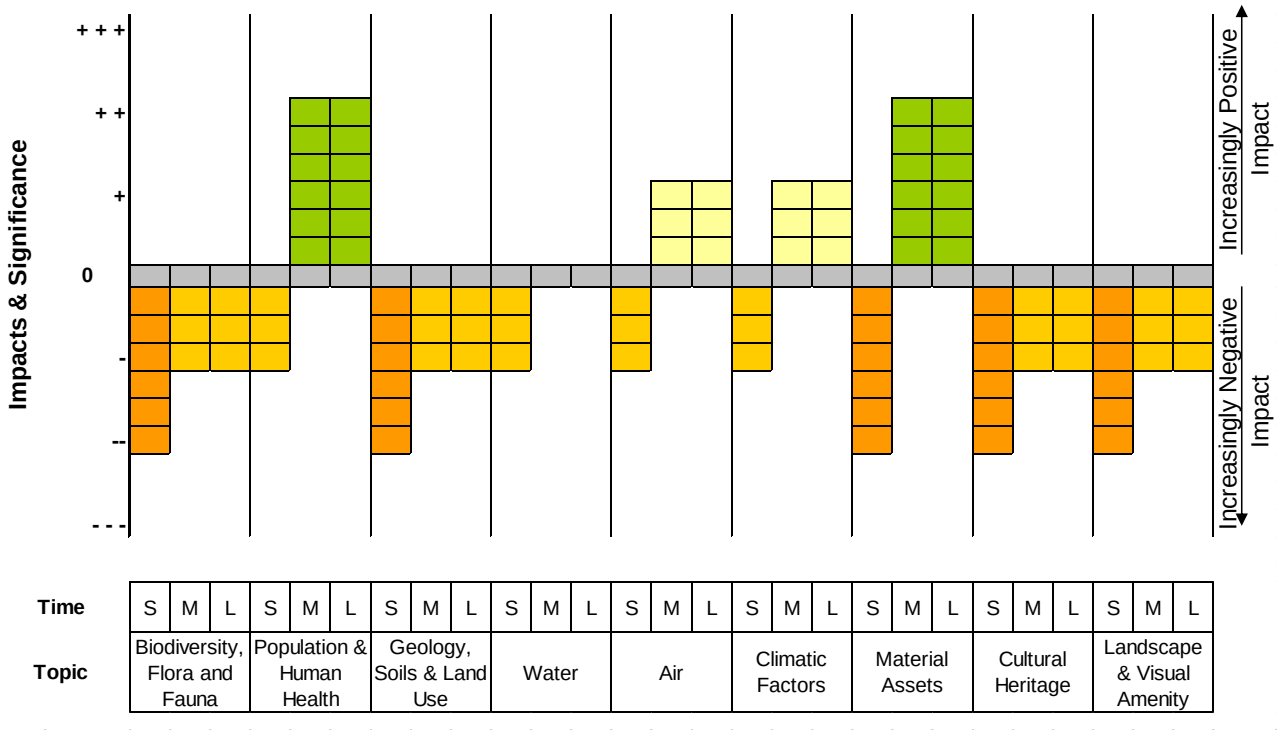
The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.



14. Mid Antrim Upgrade

Development of the Mid Antrim upgrade, comprising a new substation at Terrygowan, new 110 kV circuit from Terrygowan to Rasharkin, and uprate or the Kellt to Rasharkin 10 kV OHL, has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites, and Salmonid Rivers, and for short- to long-term, direct or indirect impacts on local designated sites. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in non-sensitive areas (-1); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+2). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation and OHL structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, moderate negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-2); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for medium- or long-term slight impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs during the restring (-2), and short- to long-term permanent negative impacts on Landscape and Visual Amenity within non-sensitive areas from the substation and new line development (-1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

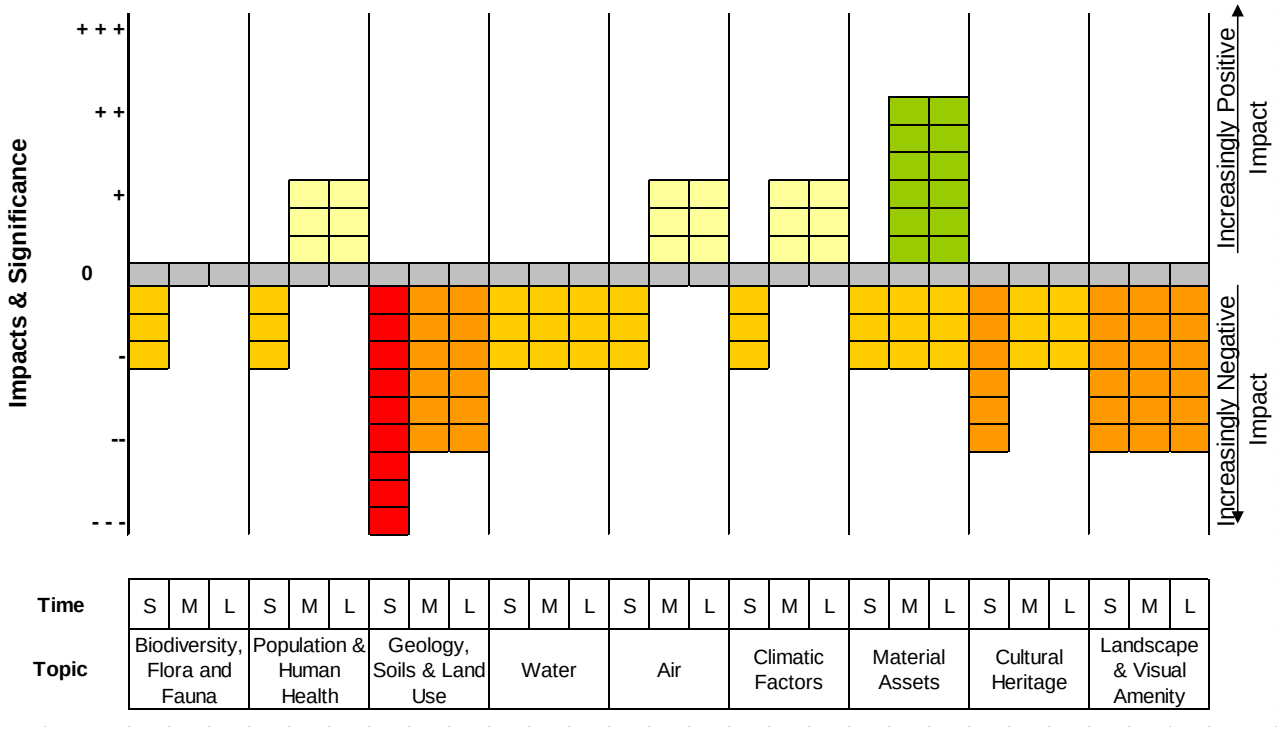


15. Northwest 110 kV Reinforcement

Development of Northwest Reinforcement, comprising new 110 kV circuit from Cam Cluster to Rasharkin, has the potential for short-term, temporary, construction phase, slight negative impacts on a local designated site and protected species due to potential hydrological connectivity (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+1) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+1). There is the potential for direct or indirect, construction phase loss of, or damage to designated earth science features (-3), and the potential for short-, medium-, and long-term, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and permanent loss of soils and existing land uses (-2). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with numerous flood risk areas in the medium- to long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for medium- or long-term slight impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs and an AONB (-2).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on 27 European Sites, from this project. The possibility of likely

significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

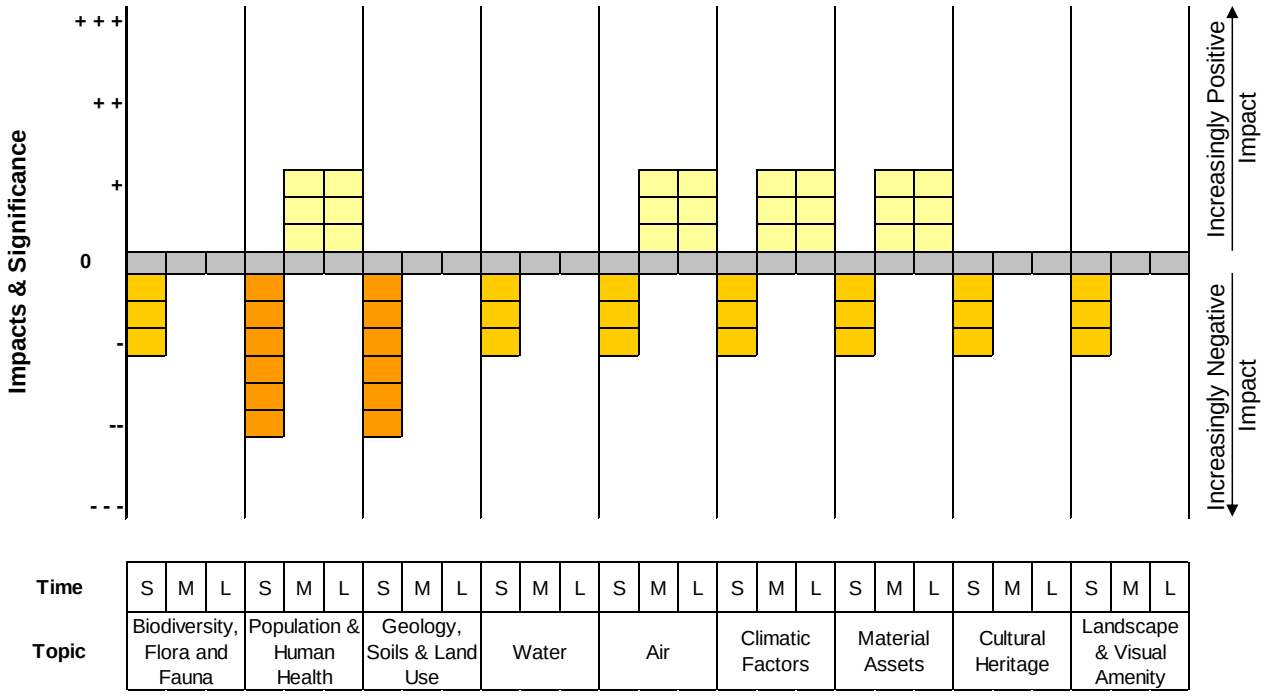


16. Omagh – Dromore Uprating

Development of the restring of existing overhead lines between Omagh and Dromore has the potential for short-term, temporary, construction phase, slight negative impacts (-1) on Biodiversity Flora and Fauna, including to Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium-

or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

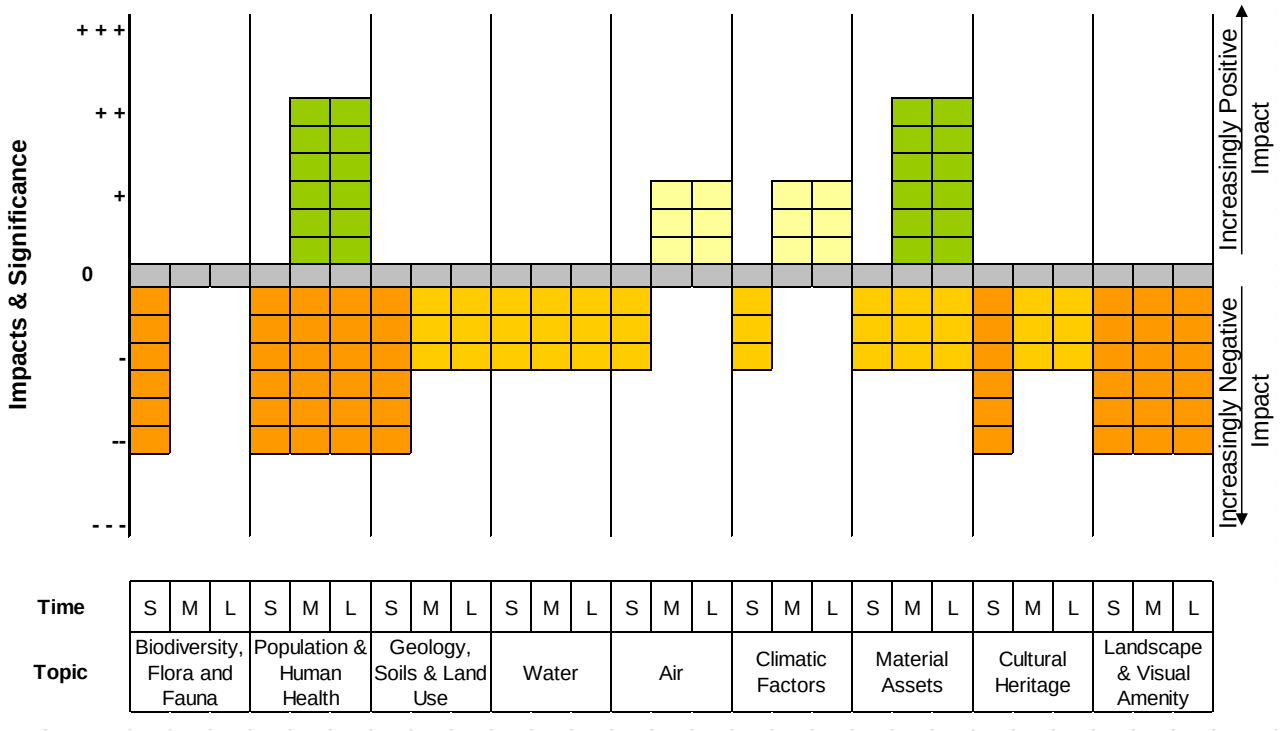


17. Mid Tyrone Upgrade

Development of the Mid Antrim upgrade, comprising new 110 kV circuit from Dromore to Tamnamore, has the potential for short-term, temporary, construction phase, indirect impacts on international, national, and local designated sites and Salmonid Rivers (-2). There is the potential for short-term, temporary, construction phase, moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+2). There is the potential for short-term, moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and medium-, and long-term, slight negative effects on Geology, Soils and Land use due to permanent loss of soils and existing land uses in the footprint of the new line structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with numerous flood risk areas in the medium- to long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable

energy connectivity (+1). There is the potential for short-term, construction phase, to long-term permanent moderate negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for medium- or long-term slight impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs from the new line development (-2).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

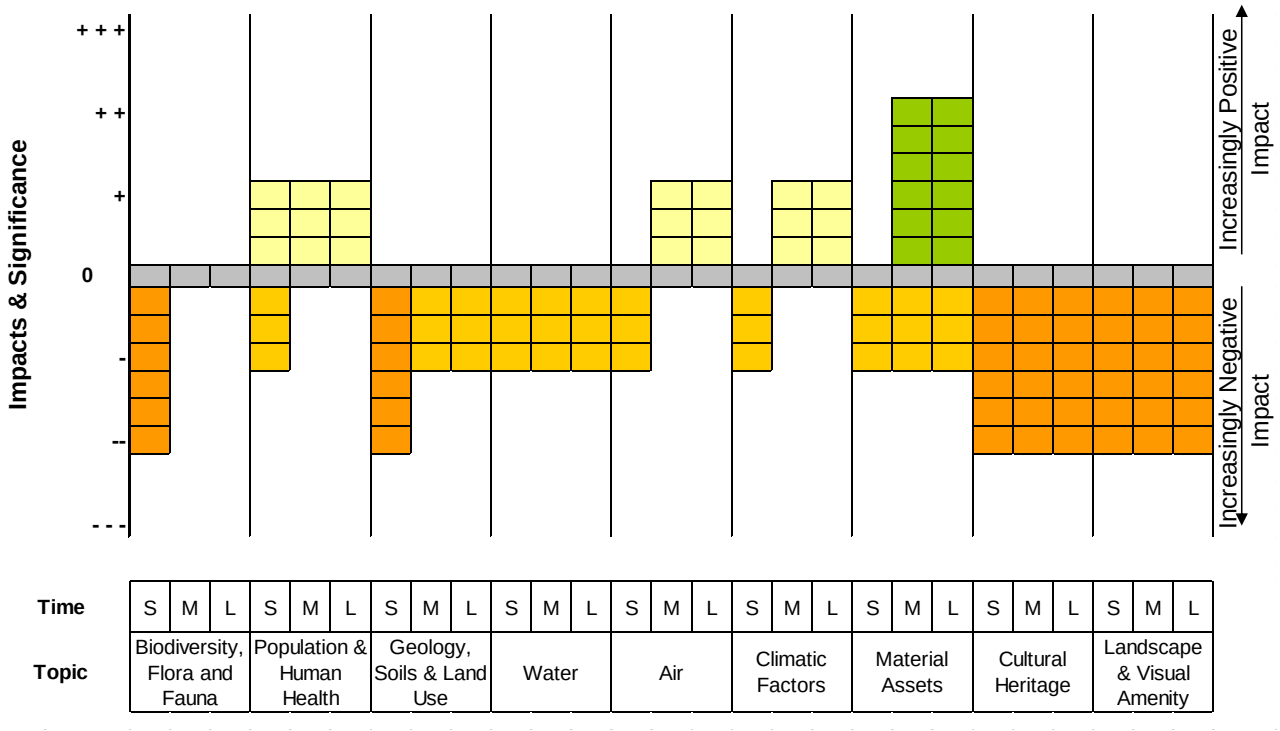


18. North Sperrin Generation Substation

Development of the North Sperrin Generation substation has the potential for short-term indirect, slight to moderate, negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national, and local designated sites. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for construction phase interaction with difficult topography and potentially contaminated sites (-2), and long-term, permanent, slight loss of soils and existing land uses in the footprint of the new substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with flood risk areas in the medium- or long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic

Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight to moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight to moderate potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-2). There is the potential for short-term, construction phase, to long-term permanent, slight negative impacts on Landscape and Visual Amenity, including within sensitive LCAs and an AONB (-2).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on eight European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

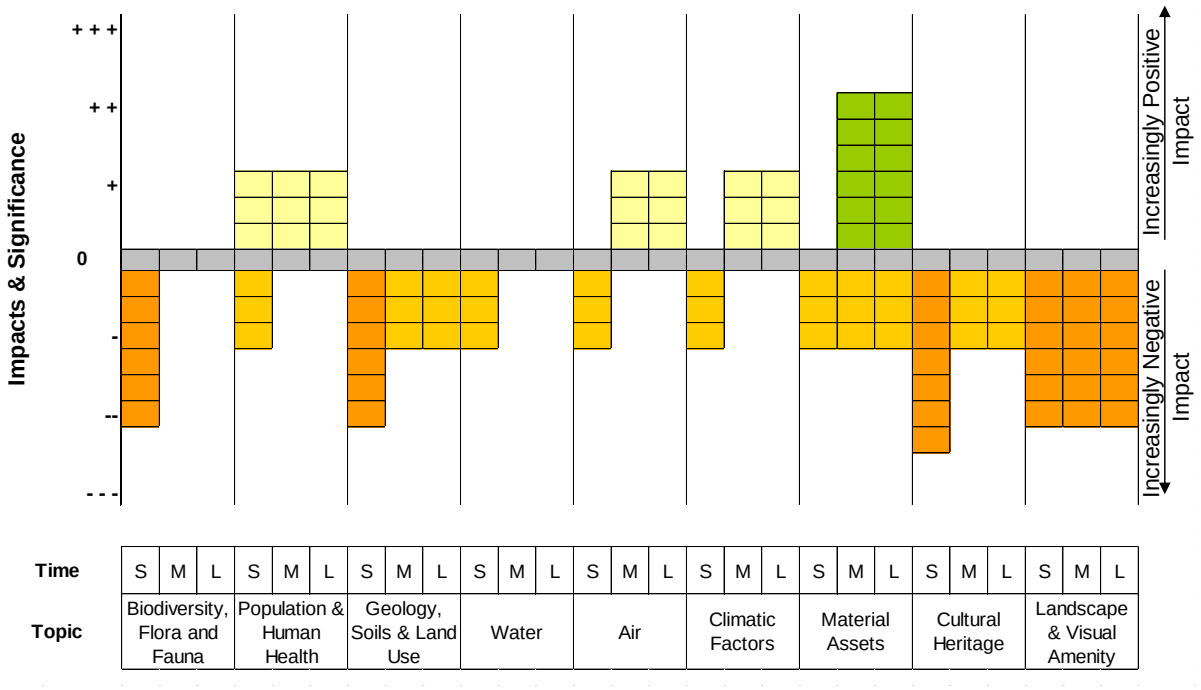


19. Cam Cluster

Development of the Cam cluster substation has the potential for short-term construction phase, slight to moderate, indirect negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national, and local designated sites and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and medium- to long-term, permanent loss of soils and existing land uses in the footprint of the new substation (-1). There is the potential for short-term, temporary, construction phase,

slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight to moderate potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-2). There is the potential for short-term, construction phase, to long-term permanent, slight to moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs and adjacent to an AONB (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

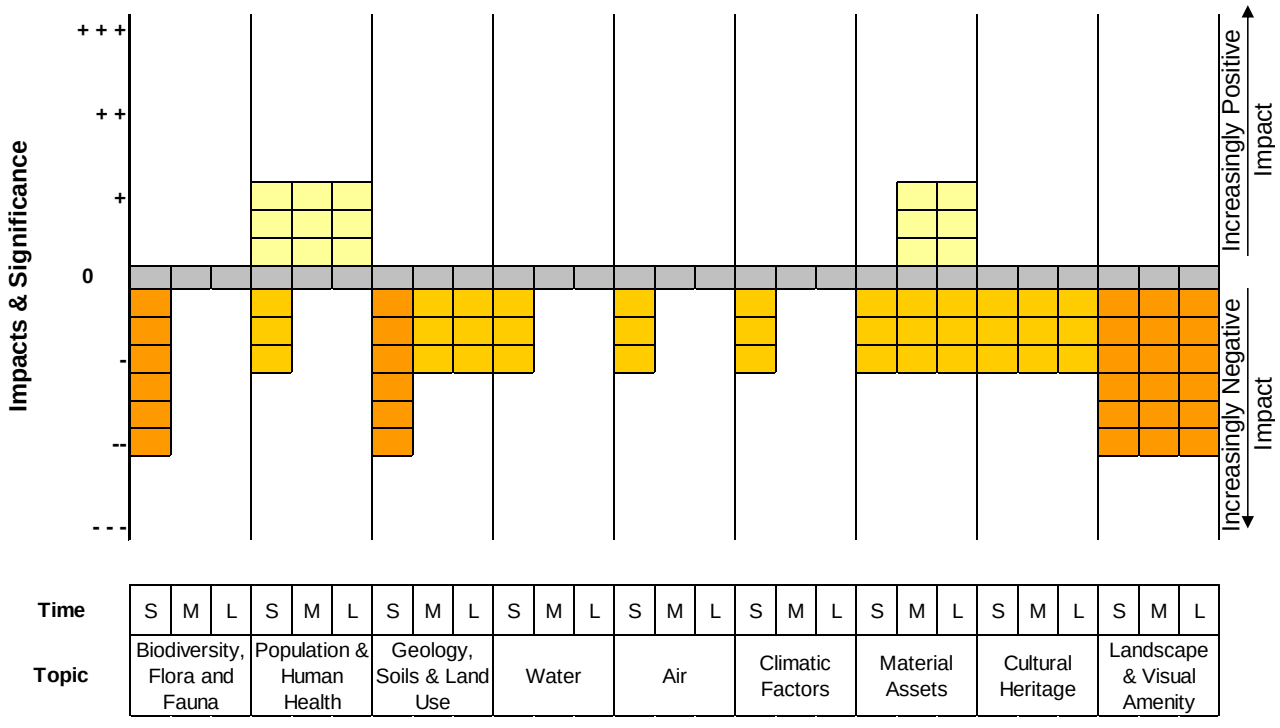


20. Castlereagh 275 kV Redevelopment

Development of the Castlereagh substation has the potential for short-term construction phase to long-term, slight negative impacts (-1) on Biodiversity Flora and Fauna, including to one locally designated site, however, this should be avoidable. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non -sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils

and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

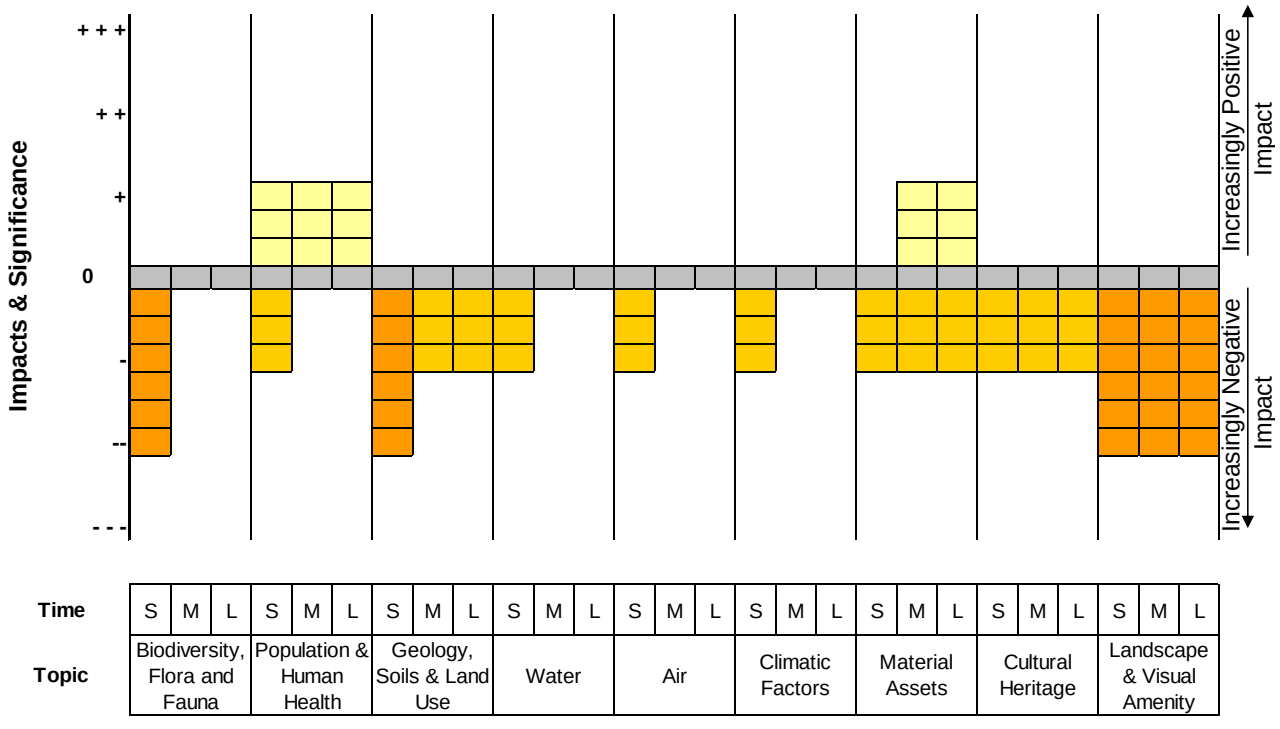


21. Coolkeeragh 275 kV Redevelopment

Development of the Coolkeeragh substation has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non -sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with

sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

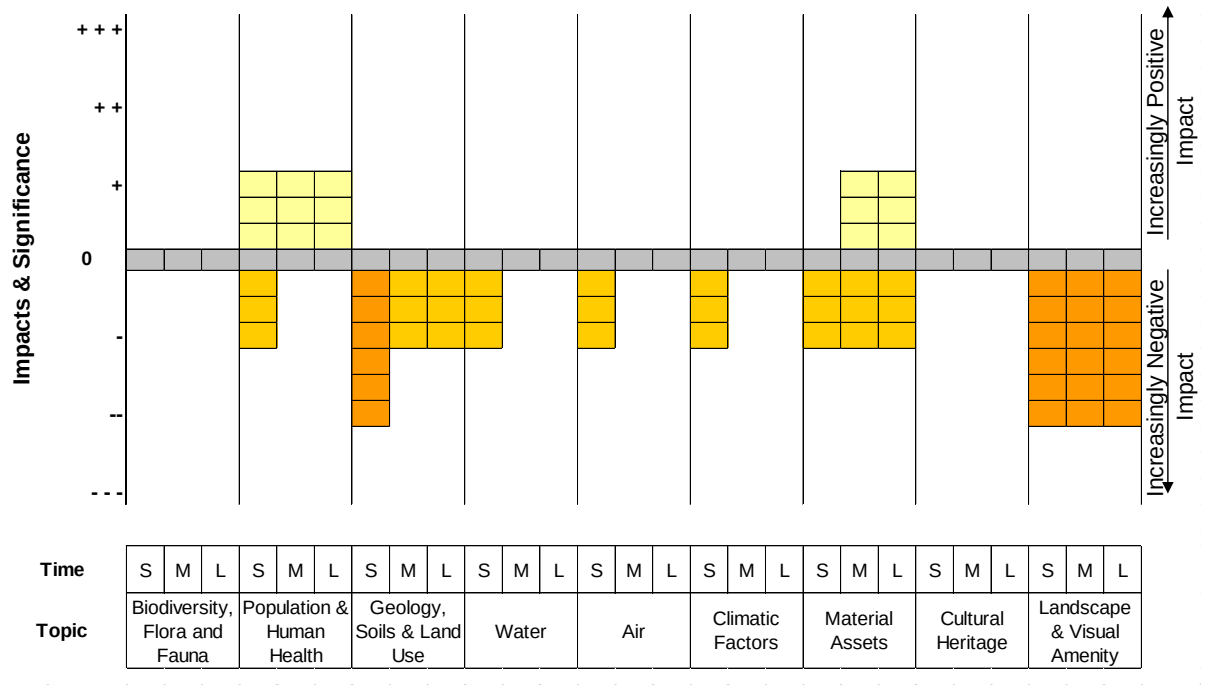


22. Kells 275 kV Redevelopment

Development of the Kells substation has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase

interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the OHL structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts on Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

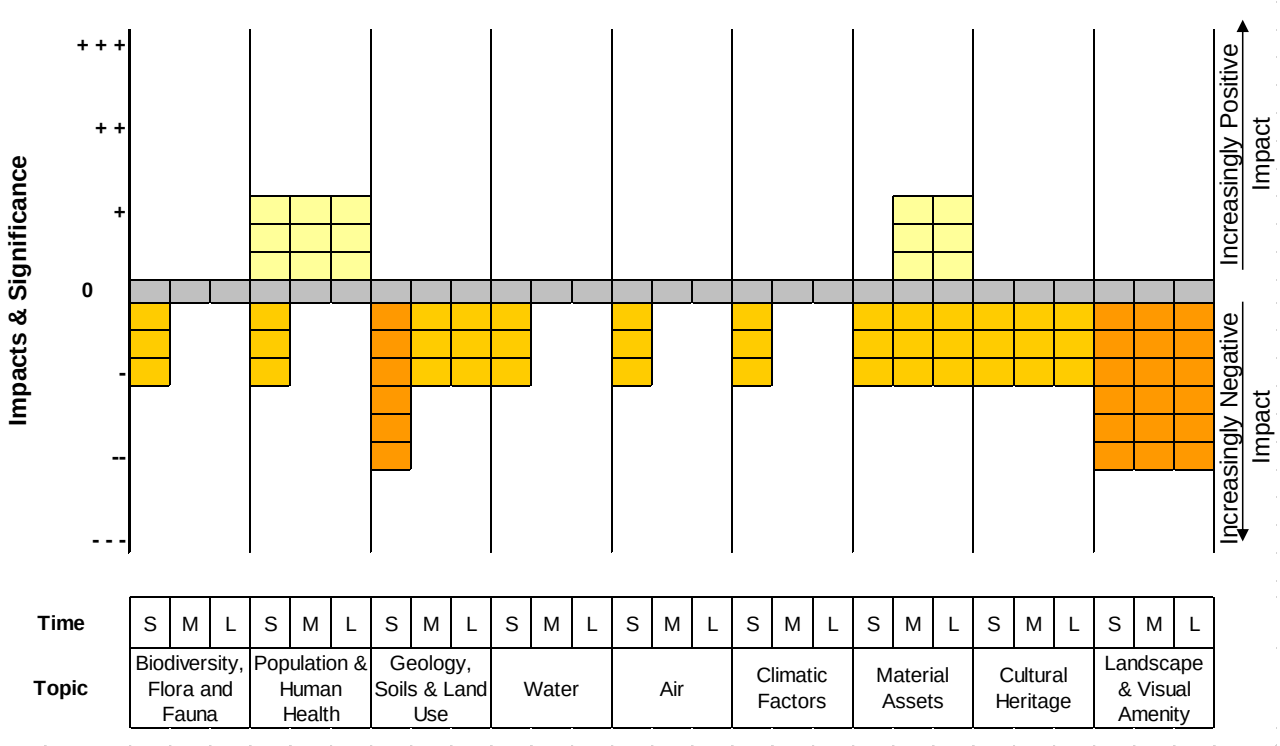


23. Magherafelt 275 kV Redevelopment

Development of the Magherafelt substation has the potential for short-term, temporary, construction phase, slight negative impacts on Biodiversity Flora and Fauna, including to one Salmonid River (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the OHL structures (-1). There is the potential for short-term, temporary,

construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

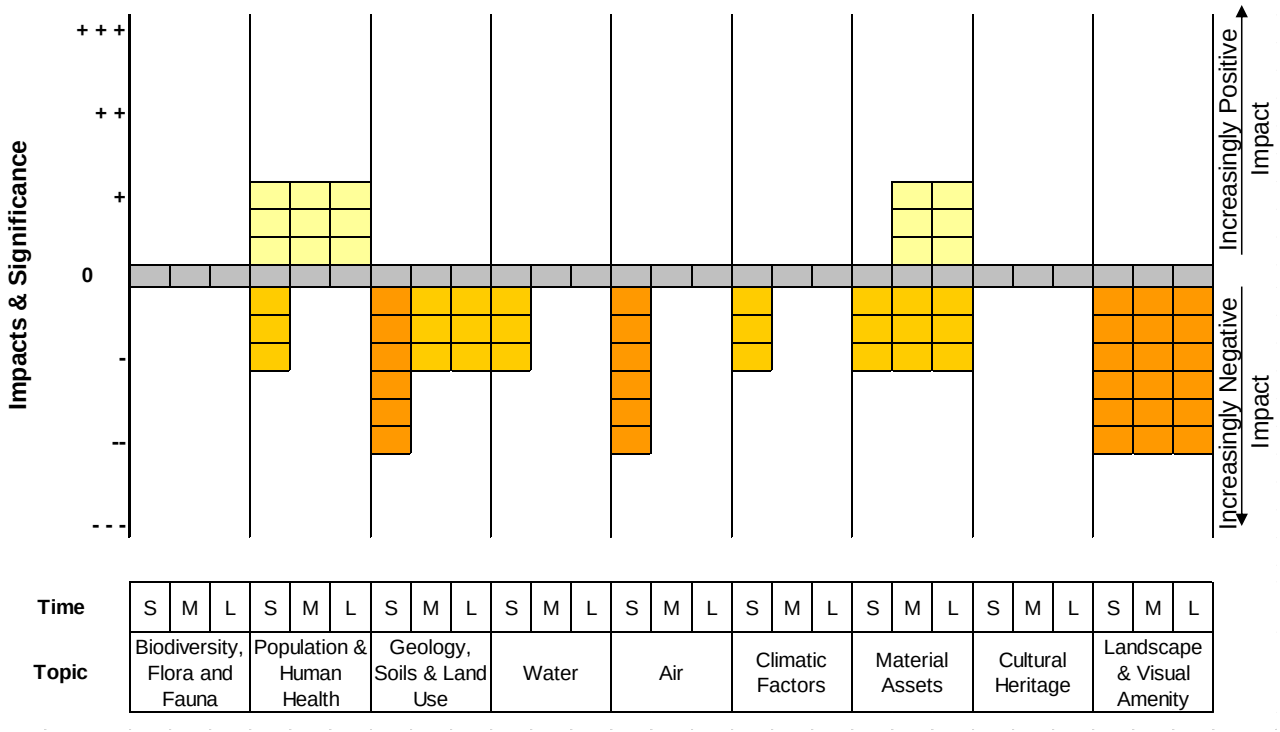


24. Tandragee 275 kV Redevelopment

Development of the Tandragee substation has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non -sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the OHL structures (-1). There is the potential for short-term, temporary, construction phase,

slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including within sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.



Cumulative / In-Combination Development Effects

Several of the projects within the TDPNI 2023-2032 are mutually exclusive and therefore will not be developed if other projects go ahead, i.e., they serve the same purpose so both would not be required. Some independent projects may, however, come together within the same geographical location and thus have more potential for in-combination or cumulative impacts. Areas were identified where independent projects could interact at construction stage and / or in the long-term operational stage, and where there is the greater potential for in-combination and / or cumulative negative impacts, which would need to be taken into consideration at the detailed planning and design stages. These areas are Cam area; Coolkeeragh area; Strabane area; Magherafelt area Rasharkin area; Kells area; Moyle area; Greater Belfast area; Omagh area; East Tyrone area; and Armagh / Tandragee area.

In addition, the HRA of the TDPNI has identified situations in which there is the potential for in-combination habitat loss, water quality and deterioration, or disturbance and displacement effects on European sites should projects be progressed and constructed at the same time.

Mitigation and Monitoring

Mitigation measures have been recommended where potential negative impacts on environmental topic areas have been identified from developing the potential projects of the TDPNI. These mitigation measures aim to prevent, reduce and as fully as possible offset any significant adverse effects on the environment due to implementation of the projects within the TDPNI.

Table 8.1 demonstrates environmental impact-specific mitigation measures that should be adopted when implementing the TDPNI to minimise the potential for any negative effects on the wider environment of developing any of the proposals assessed. These mitigation measures should be implemented and further developed at the next detailed design stage and project level study stage.

In addition to the proposed SEA mitigation, **Table 8.2** details the HRA mitigation measures that should be adopted within the TDPNI to minimise the potential for any negative effects on European sites arising from implementation of the potential projects. These mitigation measures have been included in Section 8 of the draft TDPNI and will be undertaken in the course of its adoption.

The SEA Directive requires that the significant environmental effects of the implementation of the TDPNI are monitored in order to identify, at an early stage, unforeseen adverse effects and in order to undertake appropriate remedial action. The proposed monitoring programme in **Table 8.3** is based on the Targets and Indicators established in the SEOs. This monitoring has been included in Section 8 of the draft TDPNI and should be undertaken in advance of development of the next cycle of the TDPNI, to enable the outcomes to influence the development of the Plan. Annual environmental review by SONI could also incorporate some or all of this monitoring.

Summary and Conclusions

The significant negative impacts identified by this assessment are limited to two potential projects: Energising Belfast, and the Northwest 10 kV Reinforcement. The negative impacts identified for the Energising Belfast project relate to Cultural Heritage in the short-term, reflecting the significant number of heritage features as well as the Area of Archaeological Potential that are present in Belfast City and its immediate surrounds. However, should this project be progressed, it should be possible to avoid these sites at the detailed planning and design stage, and mitigation measures have also been proposed that can minimise the potential for these negative impacts. The negative impacts identified for the Northwest 110 kV Reinforcement project relate to Geology, Soils and Land Use in the short-term, as the least cost corridor for this project directly intersects a site that is designated nationally for its geological heritage importance. However, should this project be progressed, it should be possible to avoid this site at the detailed route planning and design stage, and mitigation measures have also been proposed that can minimise the potential for these negative impacts.

Several slight to moderate, negative impacts have also been identified from the development and operation of the potential transmission development projects included in the TDPNI. However, many of these potential impacts can be avoided, or mitigated for, during the next detailed design and construction / environmental management planning stages. For the potential projects that relate to transmission infrastructure upgrades (i.e., uprating of existing lines), the negative impacts identified are mainly restricted to the construction phase, leaving no significant medium- or long-term footprint on the wider environment. However, the potential projects that relate to new transmission infrastructure (new OHLs or substations) have the potential for short-, medium- and long-term, slight to moderate negative impacts, owing to their permanent physical and visual disturbance, during and following construction. Mitigation measures have been proposed that can minimise the potential for these negative impacts, if adopted at the detailed planning and design stage of these projects, should they be taken forward. The principal mitigation recommendation is that the predicted negative effects should be considered further during the next stage of detailed planning and design, when the specifics of the development infrastructure options can be optimised through detailed feasibility studies and design in order to limit identified impacts on sensitive receptors. Further environmental studies based on the more detailed designs and construction methodologies should be undertaken as appropriate and may include, for instance, surveys of various biotic groups, landscape and visual assessments, or heritage assessments, with any recommended avoidance or mitigation measures applied to ensure that there are no significant negative environmental effects during construction or operation of the transmission infrastructure. Further Appropriate Assessment, to meet the requirements of the Habitats Directive, of the detailed designs and construction methodologies will be required at the project level, where potential impacts have been identified in this SEA and accompanying HRA for the TDPNI. At the project implementation stage, all works and planning of works should be undertaken with regard to all relevant legislation, licensing and consent requirements, and

recommended best practice guidelines. Areas that may be more sensitive to these transmission developments have also been highlighted, to help inform SONI of the areas that should be avoided to minimise potential environmental impacts.

In the medium- and long-term, the development of these potential transmission projects has the potential for slight to moderate positive impacts, including the improved reliability of the grid network, support of economic growth, and facilitating the connection and supply of more renewable energy. These positive impacts in turn will help to ensure that electricity supply is able to meet future demand, and that there is less reliance on fossil fuels into the future, resulting in better air quality and less GHG emissions. Furthermore, the projects in the TDPNI could play a key role in shaping a reliable and sustainable energy future for Northern Ireland and help achieve the 2030 renewable electricity target of the Climate Change Act.

The HRA Screening of the 79 potential projects that could come forward under the TDPNI during the plan period identified that likely significant effects on European sites could not be discounted for 42 potential projects without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects. This included the potential for significant habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts on European sites from implementation of these projects.

A shadow HRA of the TDPNI was prepared to document an appropriate assessment of the implications of the TDPNI on European sites in view of their conservation objectives. Having conducted further investigation and analysis; and having applied measures appropriate at a plan level intended to avoid or reduce the harmful effects of the implementation of their plan on European sites; and taking into consideration the safeguarding regime of lower level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI prior to those projects being consented under the planning code; it is concluded that implementation of the TDPNI will not adversely affect the integrity of any European site.

While SONI is the competent authority for the purpose of preparing the TDPNI and associated SEA, some projects will likely require statutory consent under the provisions of the Planning Act (Northern Ireland) 2011, implemented by the relevant planning authority.

Next Steps

Consultations on the draft TDPNI 2023-2032, Environmental Report and HRA are anticipated to commence in September 2023 and run for 12 weeks. These documents will be made available for viewing digitally via the SONI website – http://www.soni.ltd.uk.

Following completion of the consultation period, all comments will be collated and the draft TDPNI, Environmental Report and HRA will be reviewed and revised as necessary. Provided there are no objections or comments that will significantly alter the draft TDPNI, the final version of the TDPNI can be drafted and adopted. This is anticipated to be in Q1 2024. Following release of the adopted TDPNI, an SEA Statement will be drafted to summarise the process undertaken and identify the manner by which environmental considerations and consultations were integrated into the final TDPNI. Following adoption of the final TDPNI the next stage of development for any of the potential options is detailed design and further detailed study, incorporating the advice and mitigation measures proposed in these environmental reports.

The contact information for any information regarding the SEA of the draft TDPNI is as follows:

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By email	richard.bingham@rpsgroup.com

1 INTRODUCTION

1.1 Background

This Strategic Environmental Assessment (SEA) Environmental Report has been prepared in accordance with the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004), which implements European Union Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment.

The purpose of this Environmental Report is to provide a formal and transparent assessment of the likely significant effects on the environment arising from implementation of the Transmission Development Plan for Northern Ireland (TDPNI) 2023-2032, including consideration of reasonable alternatives.

The SEA of the draft TDPNI is being prepared on behalf of the System Operator for Northern Ireland (SONI).

1.2 Strategic Environmental Assessment

The SEA Directive requires that certain Plans and Programmes, prepared by statutory bodies, which are likely to have a significant impact on the environment, are subject to the SEA process. The SEA process is broadly comprised of the steps shown in **Figure 1-1**. These are given a summary description in **Table 1-1**.

Table 1-1 Summary Descriptions of Main Stages in SEA Process

Stage	Description	Status
Screening	Determines whether SEA is required for a Plan or Programme, in consultation with the designated statutory consultees.	Completed February – June 2023
Scoping	Determines the scope and level of detail of the assessment for the SEA, in consultation with the designated statutory consultees.	Completed February - June 2023
Environmental Assessment	Formal and transparent assessment of the likely significant effects on the environment arising from the implementation of the TDPNI, including all reasonable alternatives. The output from this is an Environmental Report which must go on public display along with the draft TDPNI.	Current Stage
SEA Statement	Summarises the process undertaken and identifies how environmental considerations and consultations have been integrated into the final TDPNI.	Anticipated Q1 2024

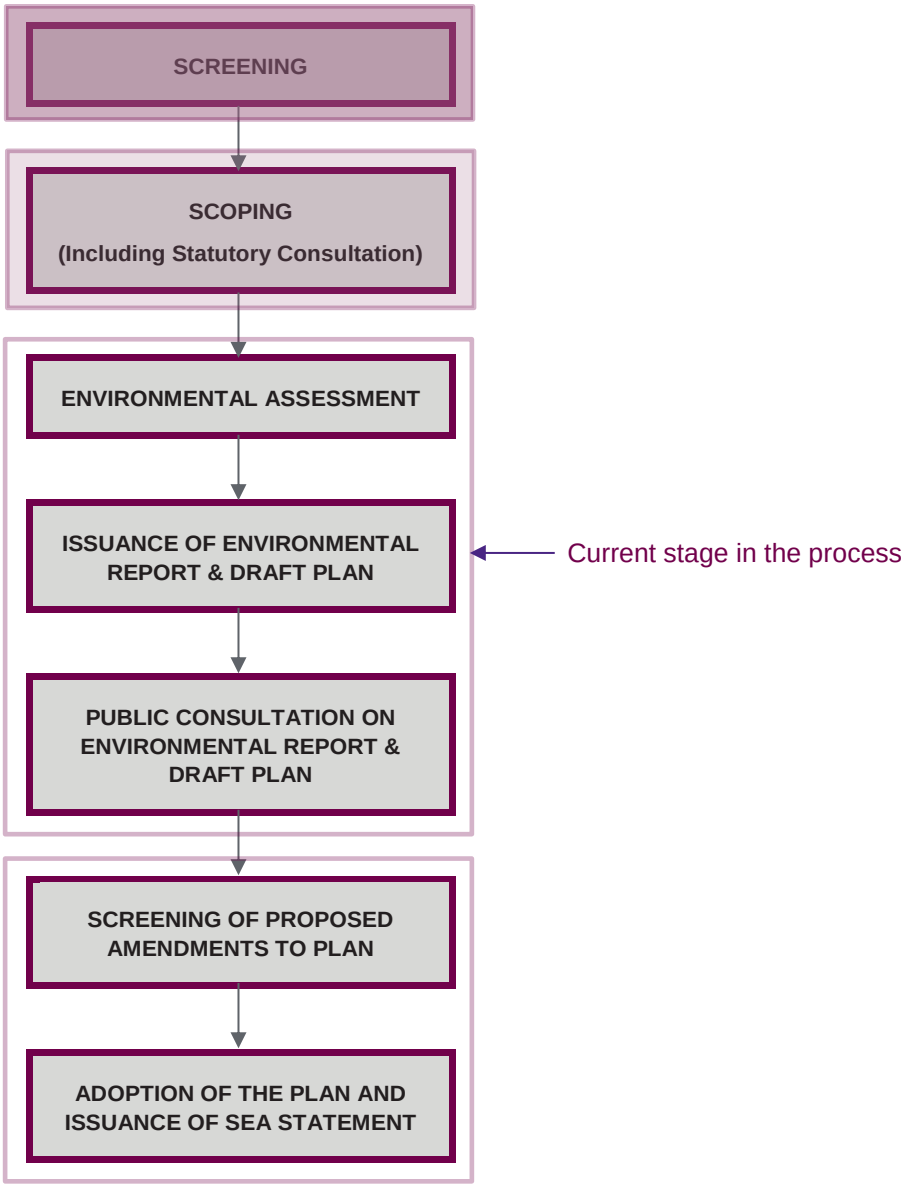


Figure 1-1 Overview of the SEA process

1.3 Screening for SEA

Under Article 2 (2) of the SEA Directive, energy plans require mandatory SEA. The TDPNI 2018-2027 committed to a review and, if considered appropriate, an update of the SEA and HRA every five years following the first version of the Plan. SONI have concluded that it is appropriate to update these assessments for the draft TDPNI 2023-2032.

1.4 Scoping for SEA

The SEA Scoping for the draft TDPNI took place from February to June 2023. The purpose of the Scoping Report was to provide sufficient information on the draft TDPNI to enable the consultees to form an opinion on the appropriateness of the scope, format, level of detail, methodology for assessment and the consultation period proposed for the Environmental Report.

The issuing of a draft Scoping Report to consultees is recommended as good practice and can inform stakeholders about the key environmental issues and the key elements of the Plan or Programme. In addition, the Scoping Report can be used as a tool to generate comments from stakeholders on the scope and approach

of the SEA. Responses received from consultees to the SEA Scoping consultation were taken into account in the Environmental Report, where possible.

Table 1-2 was created to generate discussion during the scoping process and consultation in relation to the SEA receptors and was subsequently amended following scoping responses.

Table 1-2 Potential Environmental Issues by SEA Topic

SEA Topic	Scoped In / Out	Potential Environmental Issues
Biodiversity, Flora & Fauna	**In**	• Potential for effects on protected areas, including those of international (SACs, SPAs, Ramsar Sites), national (ASSIs, MCZs, NHAs/pNHAs, NNRs) and local (SLNCIs) importance. • Potential for effects on protected Annex I habitats or Annex II species outside of designated sites and on Northern Ireland priority habitats and species. • Potential for effects on fauna, including construction-phase disturbance or longer-term effects). • Potential for effects on habitats sensitive to construction (e.g., peatlands). • Potential for effects on water-dependent habitats and species (including effects on freshwater pearl mussel, salmonids, and other protected fish and shellfish species). • Potential for habitat loss, fragmentation or deterioration (temporary or permanent). • Potential for introduction of invasive, non-native species during construction.
Population & Human Health	**In**	• Potential for disturbance of the local population during construction (e.g., dust, noise). • Potential for disturbance of the local population during operation (e.g., noise). • Potential for health and safety impacts on the local population. • Interaction between transmission infrastructure and settlement patterns. • Potential / perception of Electromagnetic Field (EMF) risk from electricity transmission lines. • Potential for cumulative effects on local populations, including in deprived or sensitive areas. • Potential effects on air quality (reduced emissions).
Geology, Soils & Land Use	**In**	• Potential for effects on sensitive soils (e.g., peat). • Potential for effects on sensitive land uses (e.g., cultivated lands, forests). • Potential for interaction with contaminated land, mines or quarries. • Potential effects of topography to risk of construction impacts.
Water	**In**	• Potential for effects on the status of WFD surface water bodies or marine water bodies during construction (via pollution or sedimentation). • Potential for effects on the status of WFD Protected Areas, including for water-dependent habitats and species, economically significant aquatic species, drinking water, recreation and nutrient sensitive areas. • Potential for interaction with areas of flood risk (fluvial, pluvial or coastal).
Air	**In**	• Potential for localised effects of air pollutants during the construction phase (plant emissions), including in sensitive areas. • Potential for localised noise effects during construction and operation. • Potential for a reduction in emissions from power stations owing to new renewable energy connections.
Climatic Factors	**In**	• Potential for effects on climate resilience (mitigation and adaptation), including extreme weather events. • Potential for interaction with areas of climate change influenced flood risk (fluvial, pluvial or coastal). • Potential for effects on lands that are carbon sinks (e.g., peatland, forests).

		• Potential effects on GHG emissions owing to new renewable energy connections.
Material Assets	**In**	• Potential for effects on energy infrastructure. • Potential for effects on transport infrastructure. • Potential for effects on agricultural lands.
Cultural, Architectural & Archaeological Heritage	**In**	• Potential for effects on archaeological features or their settings. • Potential for effects on architectural features or their settings. • Potential for effects on wrecks or other marine heritage features. • Potential for the discovery of new cultural heritage features during construction.
Landscape & Visual Amenity	**In**	• Potential for effects on areas of designated landscape quality and scenic views (i.e., in Local Area Plans). • Potential for effects on the general landscape (including riverscapes, lakescapes and seascapes) and its sensitivity to development.

1.5 SEA Guidance

Key guidance documents that have been used in the SEA for the draft TDPNI are listed in **Appendix A** of this SEA Environmental Report.

1.6 Statutory Consultees for SEA

Under Article 6 of the SEA Directive, the competent authority (in this case SONI) preparing the plan or programme is required to consult with specific "environmental authorities" (statutory consultees) on the scope and level of detail of the information to be included in the Environmental Report.

The statutory consultee established within the SEA legislation for Northern Ireland is:

- The Department of Agriculture, Environment and Rural Affairs (DAERA)

As some projects and developments from the TDPNI may be close to the border with the Republic of Ireland and having regard to the potential cross-border nature of some of the SONI / EirGrid projects, there is the potential for transboundary impacts from implementation of the Plan. For this reason, there is a requirement to undertake transboundary consultations as part of this SEA process.

The statutory consultees are established within the Irish national legislation, European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 [S.I. 435/2004] and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 [S.I. 436/2004], and their recent amendments of European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 [S.I. 200/2011] and the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011 [S.I. 201/2011], as being:

- Environmental Protection Agency (EPA);
- Department of Housing, Local Government and Heritage (DHLGH);
- Department of the Environment, Climate and Communications (DECC); and
- Department of Agriculture, Food and the Marine (DAFM).

EirGrid are developing the Grid Implementation Plan 2023-2028 for the electricity transmission system in Ireland. Transboundary consultation on this plan was undertaken with the Northern Ireland statutory consultees in late 2022 / early 2023. The SEA Scoping Report is currently at consultation stage, and is available at: https://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-SEA-Scoping-2022_Final_revised-for-consultation_CLEAN.pdf. SONI commit to engaging with EirGrid on the draft Implementation Plan 2023-2028 (due for publication in Q3-Q4 2023).

1.7 Appropriate Assessment

The Habitats Directive (Council Directive 92/43/EEC) on the conservation of natural habitats and of wild fauna and flora obliges Member States to designate, protect and conserve habitats and species of importance in a European Union context. Article 6(3) of the Habitats Directive requires that "*Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives*." The Directive was transposed into Northern Ireland legislation through the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995. Any proposed plan or project that has potential to result in a likely significant effect on a designated European site will require an Appropriate Assessment (AA). Case law has determined that the likelihood need not be great, merely possible, and that the precautionary principle must apply as set out in European Commission Guidance and as required by CJEU case law (i.e., C 127/02 '*Waddenzee*').

The output of this is a HRA Report, which has been prepared to influence the draft TDPNI and to provide statutory consultees with information on the draft TDPNI, the process undertaken for the HRA and to establish whether or not the draft TDPNI is likely to have a significant negative effect upon the integrity of any European sites(s). The findings of the HRA have been integrated into this Environmental Report and subsequently into the TDPNI.

2 DESCRIPTION OF THE TRANSMISSION DEVELOPMENT PLAN FOR NORTHERN IRELAND 2023-2032

2.1 Background to the TDPNI

SONI is the licensed independent electricity Transmission System Operator (TSO) for Northern Ireland; this licence is granted through the Northern Ireland Authority for Utility Regulation under Article 10(1)(b) of the Electricity (Northern Ireland) Order 1992 (the Order). SONI is responsible for operating and planning the development of a safe, secure, economic and reliable electricity system. Working in co-operation with the system owner NIE Networks, SONI plans the development of the electricity grid infrastructure for Northern Ireland. Investment in grid development is required to improve the grid for reliability, to support economic growth, to enable competition, and to connect more renewable energy.

The TDPNI is an annual report published by SONI that sets out the planned development to be carried out by SONI and NIE Networks on Northern Ireland's electricity transmission system over the next ten-year period. This comprises works required both to maintain the system and to enable the energy transition and further decarbonisation of energy usage. The first TDPNI covered the ten-year period from 2018-2027. Since this time, rolling annual plans have been published by SONI. The most recent TDPNI covers the period 2021-2030[3], and presents the projects that are expected to be needed for the operation of the network in the short and medium-term.

The Energy Strategy for Northern Ireland – The Path to Net Zero Energy was published in 2021[4] and sets out a roadmap for energy to 2030 that will 'mobilise the skills, technologies and behaviours needed to take us towards our vision of net zero carbon and affordable energy by 2050'. To reduce energy emissions, one of the primary targets of the Energy Strategy is to meet at least 70% of electricity consumption from renewable energy sources by 2030. In preparation for the publication of the Energy Strategy, SONI and EirGrid consulted on and published Shaping our Electricity Future[5], investigating how this target could be met. The energy strategy is supported by the Energy Strategy Action Plan[6], setting out the key supporting actions to progress and deliver on the Energy Strategy.

Subsequent to the publishing of the Energy Strategy, the Climate Change Act (NI) was introduced in 2022. This introduced more ambitious emissions targets for Northern Ireland, as follows:

- Net zero emissions by 2050, with at least 48% reduction in net emissions by 2030.
- 80% renewable electricity by 2030 (i.e., raised from the 70% target of the Strategy).

SONI has updated the way the electricity grid is developed through the production of Tomorrow's Energy Scenarios Northern Ireland (TESNI)[7]; this is a recent approach that involves developing a range of possible energy scenarios dealing with renewables and the electrification of heat and transport. The first TESNI was published in 2020 and will be reviewed and updated every two years. The final scenarios set out in the TESNI will act as an input to the grid development process. The most recent TDPNI 2021-2030 was the first plan to fully take on board the results of the TESNI in planning for the Northern Ireland transmission network. The TDPNI for 2023-2032 continues this process, taking on board the results of the TESNI in its network planning. The TDPNI will present the potential projects required in Northern Ireland over the next 10 years (2023-2032) to reinforce the electrical transmission grid and ensure the connection of generation and demand for Northern Ireland.

[3] https://www.soni.ltd.uk/media/documents/Transmission-Development-Plan-Northern-Ireland-2021-2030.pdf

[4] https://www.economy-ni.gov.uk/publications/energy-strategy-path-net-zero-energy

[5] https://www.eirgridgroup.com/site-files/library/EirGrid/Shaping_Our_Electricity_Future_Roadmap.pdf

[6] https://www.economy-ni.gov.uk/sites/default/files/publications/economy/energy-strategy-path-to-net-zero-action-plan.pdf

[7] https://www.soni.ltd.uk/newsroom/press-releases/tesni-2020/index.xml

2.2 Existing Electricity System in Northern Ireland

The basic function of an electricity system is to connect the sources of energy (generators) with the ultimate users (demand) of that energy. The electricity network can be sub-divided into the transmission and distribution systems. The transmission system moves bulk electricity on high voltage lines or underground cables from where it is generated to bulk supply points. This can be likened to a motorway or high-capacity road which facilitates the bulk of vehicle movements. The separate distribution system, which operates at lower voltages, is like smaller lower-capacity roads, delivering electricity from these bulk supply points into homes and businesses.

The existing electricity transmission system in Northern Ireland was largely in place by the late 1960s, with an electrically strong transmission system having been developed to link major fossil fuelled power stations and to deliver bulk electricity to the more heavily populated areas. There are three large fossil fuel power stations in Northern Ireland, Ballylumford, Kilroot, and Coolkeeragh.

The transmission system uses voltages at or above 110kV, which can deliver large quantities of power over long distances in a very efficient manner. The transmission system in Northern Ireland is operated at 275kV and 110kV. The 275kV network includes approximately 713km of 275kV overhead line (which is almost all double circuit line) and 1km of cable, the majority of which was developed between 1963 and 1978. The 110kV system includes 934km of overhead line and 112km of cable, the majority of which was installed between 1944 and 1958. The existing electrical transmission system in Northern Ireland is shown in **Figure 2-1**.

The electrical system in Northern Ireland is a synchronous system, which has limited High Voltage Direct Current (HVDC) interconnection to Great Britain. Northern Ireland's electrical system is connected to the Scottish system via the 0.5 GW Moyle Interconnector, which runs between Islandmagee (Northern Ireland) and Ayrshire (Scotland). The transmission systems in Northern Ireland and the Republic of Ireland are also connected, by means of a 275 kV double circuit from Louth station in Co. Louth (Republic of Ireland) to Tandragee substation in Co. Armagh (Northern Ireland). There are two smaller 110kV standby connections at Enniskillen and Strabane. A second North-South interconnector (also known as the Tyrone to Cavan Interconnector), which will operate at 400 kV, has acquired statutory planning approval in both Ireland and Northern Ireland and is planned to be fully operational by 2026.

The transmission system is designed to certain standards known as the Transmission System Security and Planning Standards[8], approved by the Utility Regulator. These standards include, among other things, a requirement that the system is designed, built and operated in such a way that if a single component fails (known as a credible contingency) an alternative will be available, and therefore there will be no interruption to customer supply. SONI is obliged to plan (including outline design and consents) an electrical system that will economically maintain compliance with these standards based on reasonable assumptions regarding the evolution of the generation, supply, and consumption of energy and exchanges with other countries. The type of generation technology deployed, and the geographical location of that generation, is not within SONI's remit, but is a matter for developers and the planning process. This implies a level of uncertainty for regulators and licensees in planning, delivering and funding system development. To reflect uncertainty SONI will perform sensitivity studies, as appropriate.

As set out in Shaping our Electricity Future, there will be major changes in how and where electricity is generated, how it is connected to the grid, how it is bought and sold, and how it is used for transport and heat, in moving the energy sector towards a more sustainable and low-carbon future. There will be a need for the electricity system to carry more power, most of which will be from renewable sources such as wind and solar. To facilitate Northern Ireland's new energy policy the transmission grid needs to be made stronger and more flexible to transport the planned increases in clean energy generation. It also needs to be secure to ensure a high quality and reliable electricity supply for consumers, with the timely maintenance or replacement of assets required to provide the necessary level of security of supply. When considering system reinforcement SONI is obliged to balance the costs to the consumer, system security and its impact on the environment.

[8] https://www.soni.ltd.uk/media/Northern-Ireland-TSSPS-September-2015.pdf

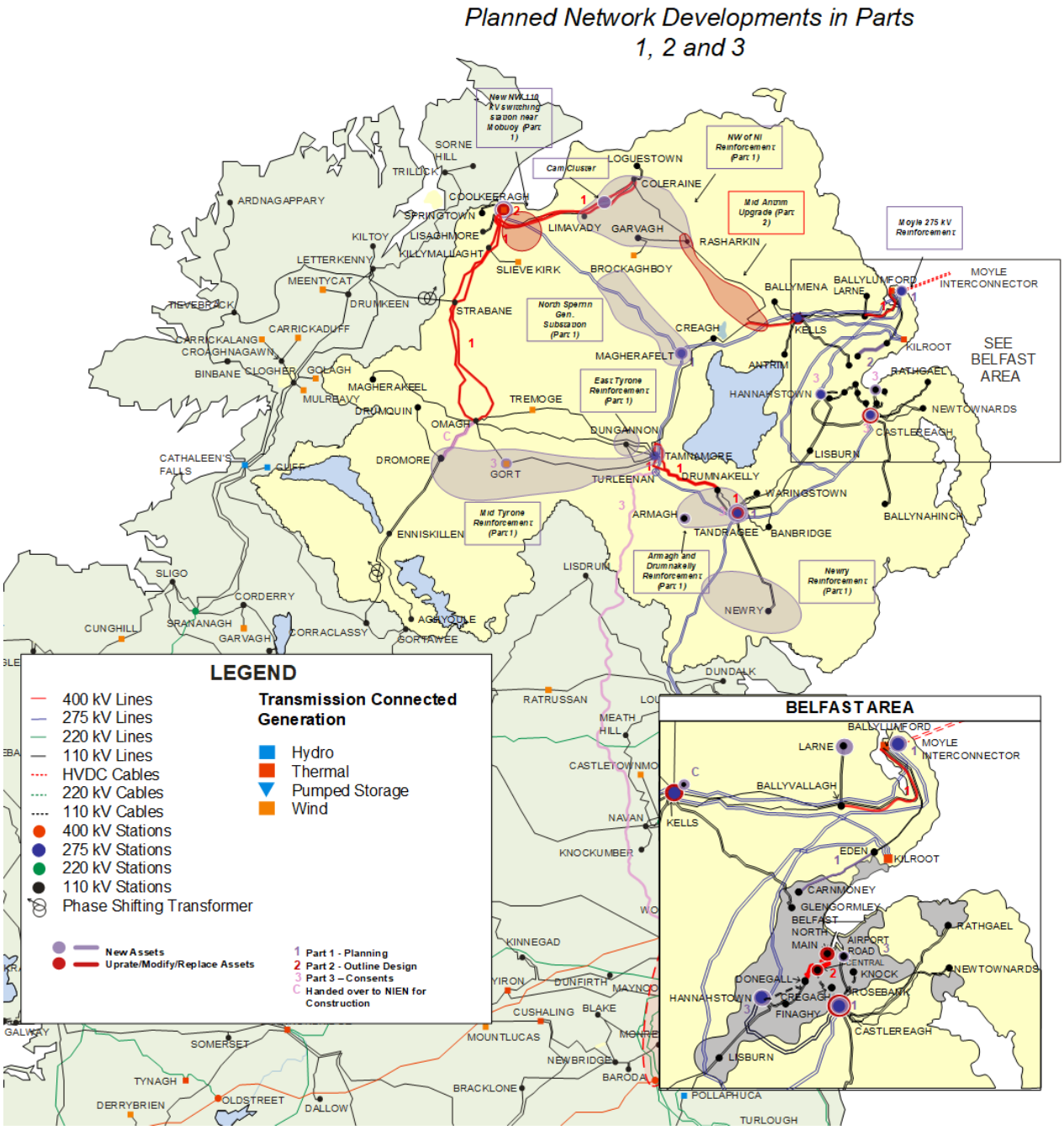


Figure 2-1 Current SONI Electricity Transmission System in Northern Ireland

2.3 Objectives and Policies of the TDPNI 2023-2032

Development of the electricity sector in Northern Ireland is guided by several national and European Union strategic objectives, including The Energy Strategy for Northern Ireland, The UK Climate Change Strategy and the EU 2030 Climate and Energy Framework. These objectives guide investment in the Northern Ireland transmission network and, in accordance with The Electricity (Northern Ireland) Order 1992, require SONI to:

- Ensure the development and maintenance of an efficient, co-ordinated, and economical system of electricity transmission which has the long-term ability to meet reasonable demands for the transmission of electricity.
- Contribute to security of supply through adequate transmission capacity and system reliability.
- Facilitate competition in the supply and generation of electricity.

SONI is responsible for the planning and operation of the transmission network within Northern Ireland. To ensure the strategic objectives described above are met, it must provide ongoing and timely reinforcement of the Northern Ireland transmission network.

SONI has a licence obligation to produce a TDPNI annually and, according to European requirements, to also contribute to a European Ten-Year Network Development Plan every two years. In accordance with Article 22 of European Directive 72/2009, the ten-year network development plan shall:

a) Indicate to market participants the main transmission infrastructure that needs to be built or upgraded over the next ten years.

b) Contain all the investments already decided and identify new investments which have to be executed in the next three years.

c) Provide for a time frame for all investment projects.

Section 4 of the draft TDPNI outlines Environmental policies (ENVP) that have been compiled to ensure that SONI has due regard for existing environmental protection legislation and environmental best practice when developing projects. Environmental objectives (ENVO) have also been developed for several environmental topics. These objectives ensure that legislative requirements and good environmental practice are integrated into the development of all Grid projects. In addition to these, the draft TDPNI sets out policies in relation to Technology, Project Development, Planning and Consenting, and Consultation and Engagement. These policies and objectives included in the TDPNI 2023-2032 are shown in **Table 2-1**. These Policies and Objectives that SONI work to in development and implementation of the TDPNI have been subject to an objective compatibility appraisal to test their compatibility with the Strategic Environmental Objectives (SEOs), as detailed in **Section 5.2**.

Table 2-1 Policies and Objectives included in the TDPNI 2023-2032

Policy / Objective	Description
	General
ENVP1	To promote best environmental practice in the design and appraisal of transmission development projects.
	Biodiversity
ENVP2	To exercise its functions as a TSO in line with the Wildlife and Natural Environment Act (Northern Ireland) 2011 and the Northern Ireland Biodiversity Strategy (2015) to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions.
ENVP3	To avoid adverse effects on sites designated for nature conservation including, Special Conservation Areas, Special Protection Areas, RAMSAR Sites, Areas of Special Scientific Interest and National Nature Reserves.
ENVP4	To protect NI priority species and habitats and other species protected under legislation in the development of any transmission infrastructure and to preserve key ecological linkage features.
ENVP5*	To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland.
ENVO1	To prepare and utilise industry specific Ecology Guidelines for the development of Transmission projects. This will ensure a standard approach to ecological impact assessment for transmission projects.
ENVO2*	To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5*.

	Climate Change
ENVP6	To integrate measures related to climate change into grid development, by way of both effective mitigation and adaptation responses, in accordance with available guidance and best practice.
	Noise
ENVP7	To employ methods on transmission infrastructure which minimise noise emissions in line with best industry practice.
ENVO2	To give careful consideration to the siting of transmission infrastructure so as to ensure that noise-sensitive receptors are protected from potential noise emissions.
ENVO3	To seek to preserve and maintain noise quality in accordance with good practice and relevant legislation.
	Landscape
ENVP8	To have regard to the Northern Ireland Landscape Character Assessment 2000, and the Northern Ireland Seascape Character Assessment in the design and appraisal of its transmission development projects.
ENVO4	To protect landscapes through the sustainable planning and design of transmission infrastructure and to have regard to important landscape designations including AONBs and the World Heritage Site.
	Cultural Heritage
ENVP9	To take reasonable measures to ensure that the special interest of protected structures, including their curtilages and settings, are protected when considering site or route options for the planning of transmission infrastructure.
ENVP10	To protect archaeological material when planning transmission infrastructure, by avoidance or by best practice mitigation measures.
	Water
ENVP11	That there is no increase in flood risk as a result of transmission development, and to ensure any flood risk to the development is appropriately managed.
ENVP12	To promote the use of sustainable urban drainage systems in any new developments where it is appropriate.
ENVP13	To have regard to Planning Policy Statements and Supplementary Planning Guidance: PPS 15 Planning and Flood Risk Development Control Considerations in the preparation of grid development strategies and plans.
ENVO5	That all grid development proposals, and in particular, transmission substation developments, shall carry out, to an appropriate level of detail, a site-specific Flood Risk Assessment that shall demonstrate compliance with all current Guidelines, standards and best practice. The Flood Risk Assessment shall pay particular emphasis to residual flood risks, site-specific mitigation measures, flood-resilient design and construction, and any necessary management measures.
	Air Quality
ENVP14	To preserve and maintain air quality in accordance with good practice and relevant legislation in the proposed construction of its transmission projects.

ENVP15	To ensure appropriate dust suppression during construction works.
	Tourism
ENVP16	To consider the potential impact upon tourism in the planning of transmission projects.
ENVO6	To identify the nature of tourism in a project area; to consider the cumulative / in combination impact on tourism of a project and to consider short term and long-term impacts of grid development projects on tourism as appropriate.
	Technology
TP1	To promote and facilitate the sustainable development of a high-quality transmission grid to serve the existing and future needs of the NI population.
TP2	To consider all practical technology options in the development of projects, including maximising use of existing transmission grid.
	Project Development
PDP1	To develop projects in accordance with SONI's *Process for Developing the Grid in Northern Ireland.*
PDP2	To promote sustainable grid development by balancing complex and/or competing technical, economic, environmental, social and deliverability goals and priorities in decision-making.
PDP3	To ensure that grid development is carried out in an economically efficient manner, and seek derogation from the Utility Regulator when this is not possible.
	Planning and Consenting
PCP1	To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents.
PCP2	To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects.
PCP3	To promote sustainable grid development by balancing complex and/or competing technical, economic and environmental goals and priorities in decision-making.
	Consultation and Engagement
CEP1	To consult and engage with statutory and non-statutory stakeholders, including communities, landowners and the general public, at the earliest appropriate stage of a project's development.
CEP2	To recognise and develop the essential role that communities, landowners and other stakeholders play in transmission infrastructure development, and to engage with different stakeholders as appropriate during the life of a grid development project.
CEP3	To ensure consultation and engagement feedback is appropriately considered in decision making.

*Proposed new environmental policy and objective of the draft TDPNI 2023-2032

2.4 Scope of the Draft TDPNI

2.4.1 Geographic Extent of the Draft TDPNI

The draft TDPNI 2023-2032 is a national level plan for the electricity transmission system of Northern Ireland. It will also link with the transmission systems of the Republic of Ireland and Great Britain. The geographical extent of the existing SONI electricity transmission system is shown in **Figure 2-1**. The geographical scope of the SEA (i.e., the area with potential to be affected by the proposed developments outlined in the draft TDPNI) will primarily focus on grid development projects at a national to regional scale, while having careful regard to any likely significant environmental effects of a transboundary nature in the Republic of Ireland. It is unlikely that the upgrading and development of the electricity transmission system in Northern Ireland will have any significant transboundary effects upon Great Britain.

2.4.2 Temporal Extent of the draft TDPNI

The draft TDPNI is proposed to cover the period from 2023 to 2032. Projects from the TDPNI that are likely to be progressed over the next 10 years will be detailed within the Plan. The TDPNI will be a rolling plan, and will be subject to annual updates, as per licence requirements set out by the Utility Regulator.

As set out in the SEA Environmental Report for the TDPNI 2018-2027, although not a statutory obligation, it is proposed that the SEA environmental reporting for the TDPNI will continue to have a nominal life span of five years. This SEA process represents the first full SEA review of the TDPNI. It is proposed that the process will continue whereby each annual revision of the TDPNI following the 2023-2032 Plan will be subject to an Environmental Appraisal to monitor the impacts of the TDPNI, in line with the adopted environmental monitoring from the SEA, and that every five years the relevant TDPNI will be reviewed for the purpose of undertaking a new SEA, if required. On that basis, the next TDPNI to be subject to a full SEA review, if required, will be for the period 2028-2037.

As implementation of many of the projects outlined in the TDPNI 2023-2032 will be on a supply and demand basis, there may be no specific timeframe for their development, or certainty as to whether they will be developed. The SEA will consider the potential for short-term (construction phase), medium-term (re-establishment and initial operational phase, considered as 0-5 years post-construction), and long-term (operational phase, 5 years post-construction onwards) impacts from implementing the proposed projects set out in the draft TDPNI 2023-2032 (including reference to secondary, cumulative, synergistic, permanent and temporary, positive and negative effects), in line with the requirements of the SEA Directive.

2.5 Proposed Plan Options

The draft TDPNI has defined a list of the potential projects that could be developed within the Plan period up to 2032, which are summarised in **Table 2-2**. A number of these potential projects were screened out of requiring assessment as the works are of such a scale as not to be considered significant and / or are localised to within existing electrical transmission sites / substations, or as the proposals have gone beyond strategic planning to the detailed planning stage and so will only be considered for cumulative and in-combination impacts. The outcomes of this screening from the SEA Scoping Report are also given in **Table 2-3**. Many of these proposals that have been screened in may require future environmental studies at the project level, such as Environmental Impact Assessment under the Environmental Impact Assessment (EIA) Directive 85/337/EEC, as transposed by The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999 and amended by The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017. These projects listed are the options available to the Plan that could be developed within the Plan period. However, these projects will only be developed on an as-required basis, i.e., should an electricity generator be developed that needs to transmit energy to users, or should there be a requirement for significant uprating to cope with demand.

Table 2-2 Draft TDPNI 2023-2032 List of Potential Developments and Projects: Screening for the need for inclusion in the SEA

Project Name	Description	In TDPNI 2018?	Screened In / Out of Assessment
Asset Replacement projects			

Shunt Reactors	New shunt reactors at Tamnamore, Tandragee, Castlereagh and Hannahstown substations. *Estimated Completion Date: 2024*	Partially	**Out**. Very localised impacts only within existing sites.
CVT PQ	Upgrading equipment within substation. *Estimated Completion Date: 2023*	No	**Out**. Very localised impacts only within existing sites.
Larne Transformer Replacement	Replacement of transformers within existing substation. *Estimated Completion Date: 2026*	No	**Out**. Very localised impacts only within existing sites.
Limavady Transformer Replacement	Replacement of transformers within existing substation. *Estimated Completion Date: 2026*	No	**Out**. Very localised impacts only within existing sites.
Ballylumford – Eden 110 kV Circuit Uprate	The conductor on the existing tower line as well as a number of towers and foundations will be replaced due to the condition and age of the existing assets. The conductor will also be uprated to cater for increased demand. *Estimated Completion Date: 2023*	No	**Out**. Planning approved. Cumulative / in-combination impacts only.
Interconnector			
North-South Interconnector	New 400 kV circuit from existing Woodland 400 kV station in County Meath (RoI) to a proposed 400/275 kV station at Turleenan in County Tyrone (NI). *Estimated Completion Date: 2026*	Yes (no change in scope)	**Out**. Planning approved. Cumulative / in-combination impacts only.
Moyle Interconnector Capacity Increase	At present, full utilisation of the 500 MW export capability of the Moyle Interconnector is prevented by the potential for network overloads and voltage steps in the event of the loss of the 275 kV double circuit between the Moyle converter station at Ballycronan More and the nearby Ballylumford substation. This project involves works to allow reconfiguration of the connection to Moyle to address this contingency. *Estimated Completion Date: 2028*	No	**In.** Potential for impacts.
Load Related and Security of Supply			
Airport Road 110/33 Substation	New 110/33 kV substation on Sydenham Road, Belfast; upvoltaging of 33 kV line from Rosebank to 110 kV *Estimated Completion Date: 2026*	Yes (no change in scope)	**Out**. Planning approved. Cumulative / in-combination impacts only.
Armagh and Drumnakelly Reinforcement	New 110/33 kV substation at Armagh, supplied by 2 x 110 kV circuit from Tandragee *Estimated Completion Date: 2029*	Yes (as Drumnakelly and Armagh Development Plan)	**In.** Potential for impacts.
East Tyrone Reinforcement	Extension of Dungannon main and installation of 2 new 110/33 kV transformers. The	No	**In.** Potential for impacts.

	substation itself will be expanded onto adjacent land. *Estimated Completion Date: 2027*		
Newry Reinforcement	Increase in capacity at Newry Main. This project is at an early stage and options are still to be fully developed. Likely alternatives include construction of a 2nd substation adjacent to Newry Main and uprating of the overhead lines to Tandragee; a new substation near Newtownhamilton connecting to the Louth - Tandragee 275 kV overhead double circuit; or new 33 kV (distribution) circuits transferring load from Newry to Armagh. *Estimated Completion Date: 2030*	No	**In.** Potential for impacts.
Coolkeeragh 110 kV cable uprate	Replacement of cable within substation. *Estimated Completion Date: 2026*	Yes (no change in scope)	**Out**. Very localised impacts only within existing sites.
Coolkeeragh - Limavady - Coleraine 110 kV Uprating	Uprating of all existing overhead lines between Coolkeeragh, Limavady and Coleraine *Estimated Completion Date: 2029*	No	**In.** Potential for impacts.
Drumnakelly - Tamnamore 110 kV Uprating	Undergrounding of overhead line through Killyman village and replacement with cable in road. Refurbishment of remainder of both overhead lines between Tamnamore and Drumnakelly. *Estimated Completion Date: 2029*	No	**In.** Potential for impacts.
Ballylumford - Ballyvallagh uprate	Uprating of existing overhead lines between ballylumford and Ballyvallagh. *Estimated Completion Date: 2033*	No	**In.** Potential for impacts.
Northwest Special Protection Scheme	Upgrading equipment within Coolkeeragh and Magherafelt substations. *Estimated Completion Date: 2023*	Yes (no change in scope)	**Out**. Very localised impacts only within existing sites.
Gort 2nd Transformer	Additional transformer at existing substation. *Estimated Completion Date: 2024*	No	**Out**. Very localised impacts only within existing sites.
New NW 110 kV Switching Station	New 110 kV substation south of Derry (Mobuoy area) marshalling several 110 kV circuits together. Early-stage project with little detail as yet. *Estimated Completion Date: 2032*	No	**In.** Potential for impacts.
Coolkeeragh 110 kV Extension	Extension of existing 110 kV substation to the North (up to road). *Estimated Completion Date: 2029*	No	**In.** Potential for impacts.
Dual Asset Replacement / Load Related and Security of Supply Projects			
Energising Belfast	New cables and substations in city centre, commissioning of transformer 4 at Castlereagh, removal in stages of Carnmoney - Castlereagh 110 kV overhead line.	No	**In.** Potential for impacts.

	Estimated Completion Date: 2028		
Eden-Carnmoney Reinforcement	Removal of overhead line in Carnmoney and Carrickfergus and replacement with new underground cable laid in roads. Refurbishment of overhead line in rural area between Carnmoney and Carrickfergus. Installation of a 2nd 110/33 kV transformer at Glengormley Main. *Estimated Completion Date: 2027*	No	**In.** Potential for impacts.
Renewable Integration Developments			
Coolkeeragh-Killymallaght-Strabane 110 kV Uprating	Uprating of all existing overhead lines between Coolkeeragh, Killymallaght, and Strabane *Estimated Completion Date: 2031*	No	**In.** Potential for impacts.
Omagh - Strabane 110 kV Uprating	Uprating of both existing overhead lines between Omagh and Strabane *Estimated Completion Date: 2029*	No	**In.** Potential for impacts.
Mid Antrim Upgrade	New 110 kV circuit from Terrygowan to Rasharkin (mostly OHL, route TBD), new substation at Terrygowan, uprate of Kells - Terrygowan 110 kV double circuit overhead line *Estimated Completion Date: 2029*	Yes (as Creagh/Kells-Rasharkin New 110 kV circuit)	**In.** Potential for impacts
Northwest 110 kV Reinforcement	New 110 kV circuit from Cam Cluster to Rasharkin. Route TBD. *Estimated Completion Date: 2030*	Yes (as part of North West of NI Reinforcement).	**In.** Potential for impacts.
Omagh - Dromore Uprating	Uprate of existing double circuit overhead line between Dromore and Omagh *Estimated Completion Date: 2023*	Yes (as Omagh - Omagh South. No change in scope)	**In.** Potential for impacts.
Mid Tyrone Upgrade	New 110 kV circuit from Dromore to Tamnamore. Mostly overhead line but anticipated to have c. 6km of cable at Eastern end. Route TBD. *Estimated Completion Date: 2030*	Yes (as part of North West of NI Reinforcement)	**In.** Potential for impacts.
North Sperrin Generation Substation	New substation in North Sperrins area (near Feeny) connecting a number of windfarms, connected to magherafelt at 110 kV (mix of cable and OHL, route TBD). Extension of Magherafelt and installation of shunt reactor and 275/110 kV transformer. *Estimated Completion Date: 2030*	No	**In.** Potential for impacts.
Renewable Generation Cluster Substations and New Connections			

Kells 110/33 kV Cluster	Establish a 110/33 kV cluster substation at existing Kells 275/110 kV substation to connect new renewable generation to the transmission system, connected to the existing Kells 110 kV station via an underground cable. *Estimated Completion Date: 2025*	Yes (no change in scope)	**Out**. Planning approved. Cumulative / in-combination impacts only.
Cam Cluster	New cluster substation between Limavady and Coleraine (near Cam quarry). *Estimated Completion Date: 2029*	No	**In.** Potential for impacts.
Fault Level Replacements			
Castlereagh 275 kV Redevelopment	Refurbishment or offline replacement of existing 275 kV substation on adjacent site *Estimated Completion Date: 2034*	No	**In.** Potential for impacts if substation replaced at new location.
Coolkeeragh 275 kV Redevelopment	Refurbishment or offline replacement of existing 275 kV substation on adjacent site. *Estimated Completion Date: 2031*	No	**In.** Potential for impacts if substation replaced at new location.
Kells 275 kV Redevelopment	Refurbishment or offline replacement of existing 275 kV substation on adjacent site. *Estimated Completion Date: 2031*	No	**In.** Potential for impacts if substation replaced at new location.
Magherafelt 275 kV Redevelopment	Refurbishment or offline replacement of existing 275 kV substation on adjacent site. *Estimated Completion Date: 2031*	No	**In.** Potential for impacts if substation replaced at new location.
Tandragee 275 kV Redevelopment	Refurbishment or offline replacement of existing 275 kV substation on adjacent site. *Estimated Completion Date: 2038*	No	**In.** Potential for impacts if substation replaced at new location.
Castlereagh 110 kV Switchgear Uprate	Upgrading equipment within substation. *Estimated Completion Date: 2028*	Yes (No change in scope)	**Out**. Very localised impacts only within existing sites.
Tandragee 110 kV Switchgear Uprate	Upgrading equipment within substation. *Estimated Completion Date: 2028*	Yes (No change in scope)	**Out**. Very localised impacts only within existing sites.

The projects that were screened in for environmental assessment as part of the SEA are presented in **Table 2-3**. These projects can be summarised by the four general development types that have been identified:

1. New transmission lines
2. Transmission Line Restring or Uprate

3. New Substation
4. Substation Extension or Upgrade

The development and maintenance works involved in these project types are summarised in the following **Section 2.5.1**.

Table 2-3 Projects Screened in and Assessed as part of the SEA

Project ID	Project Name	Development Type
1	Moyle Interconnector Capacity Increase	New Transmission Line cabling
2	Armagh and Drumnakelly Reinforcement	New Substation and Transmission Line
3	East Tyrone Reinforcement	Substation Extension
4	Newry Reinforcement	New Substation and New / Uprate Transmission Line
5	Coolkeeragh - Limavady - Coleraine 110 kV Uprating	Transmission Line Restring / Uprate
6	Drumnakelly - Tamnamore 110 kV Uprating	Transmission Line Underground Cables and Restring / Uprate
7	Ballylumford - Ballyvallagh uprate	Transmission Line Restring / Uprate
8	New NW 110 kV Switching Station	New Substation and New / Uprate Transmission Line
9	Coolkeeragh 110 kV Extension	Substation Extension
10	Energising Belfast	New Substation and Transmission Line
11	Eden-Carnmoney Reinforcement	Transmission Line Underground Cables and Restring / Uprate
12	Coolkeeragh-Killymallaght-Strabane 110 kV Uprating	Transmission Line Restring / Uprate
13	Omagh - Strabane 110 kV Uprating	Transmission Line Restring / Uprate
14	Mid Antrim Upgrade	New Substation and Transmission Line, Transmission Line Restring / Uprate
15	Northwest 110 kV Reinforcement	New Transmission Line
16	Omagh - Dromore Uprating	Transmission Line Restring / Uprate
17	Mid Tyrone Upgrade	New Transmission Line and Underground Cables
18	North Sperrin Generation Substation	New Substation, Substation Extension, New Transmission Line and Underground Cables
19	Cam Cluster	New Substation
20	Castlereagh 275 kV Redevelopment	New substation or Substation Extension
21	Coolkeeragh 275 kV Redevelopment	New substation or Substation Extension
22	Kells 275 kV Redevelopment	New substation or Substation Extension
23	Magherafelt 275 kV Redevelopment	New substation or Substation Extension
24	Tandragee 275 kV Redevelopment	New substation or Substation Extension

2.5.1 Development Types

2.5.1.1 Overhead Transmission Lines

Overhead transmission lines comprise a *conductor* (aluminium or steel strand), suspended at a defined clearance height between a series of supporting structures; insulators prevent the current from crossing between the conductor and the structure.

Overhead lines can be constructed in *single circuit* or *double circuit* formations. The three phases of single circuit overhead lines are carried in the horizontal plane. Double circuits (wherein two separate circuits are supported on a single structure) generally only occur where two single circuit lines are in proximity or where a route corridor is very constrained. The three phases of double circuit overhead lines are carried in the vertical plane. Additional earth (shield) wires may also be incorporated above the conductors to protect the overhead line from lightning strikes. Optical fibre may also be wrapped around the shield wire; this is used for communication purposes, including controlling the power system.

2.5.1.1.1 Structures

Conductors are typically supported on steel lattice towers or wooden pole sets. *Intermediate towers* occur along straight sections of an overhead line. A*ngle towers* are used where a line changes direction and conductors must be held under tension. *Terminal towers* are generally constructed where an overhead line enters a substation but may also be used where there is an interface between an overhead line and an underground cable.

The design of structures required along an overhead line vary according to the voltage and can be dependent on the local environment in which they are situated e.g., variable terrain, ground conditions, required clearance from other infrastructure and other constraints. **Table 2-4** summarises the various structure types utilised in the transmission network on the island of Ireland.

Table 2-4 Details of Transmission Structures

Structure	Material & Dimensions	Foundation	Spacing
400 kV	Lattice steel structures, concreted into the ground. Height typically ranges from 20 m to 48 m.	Four foundation blocks are excavated, each block ranging in diameter from 2.8 m to 5.3 m, depending on the tower design (single or double circuit angle tower or double circuit intermediate tower).	Average span is 350 m depending on local landscape features and topography.
275 kV	Lattice steel towers are also used to support 275 kV conductors in Northern Ireland and are built to the same standard as the 400 kV infrastructure described above.		
220 kV	Lattice steel structures, concreted into the ground. Height typically ranges from 27 m to 37 m.	Four foundation blocks are excavated, ranging in width from 1.4 m to 3.9 m depending on the tower design (single or double circuit angle tower or double circuit intermediate tower).	Average span is 320 m depending on local landscape features and topography.
110 kV pole set	Wooden pole sets consisting of two wooden poles, 5m apart and connected near the top with a rolled steel channel. The wooden poles are typically between 16 m and 23 m in height.	A minimum of 2.3 m of pole is buried underground; no concreting around the base of the poles is carried out under normal ground conditions. Wooden sleepers are affixed to the bases of the pole sets in a narrow (0.8 m) excavation perpendicular with the	The span between 110 kV structures ranges between 180 and 300 m, depending on local landscape features and topography.

	Where an OHL angle less than 20 degrees is required, a braced pole set may be erected. These comprise a modified version of a standard pole set wherein the space between the poles is reinforced with steel members. Three-pole intermediate pole sets may also be erected in certain cases, comprising a 5 m spacing between poles.	overhead line alignment; this delivers improved stability. Where ground conditions dictate, stay wires from the pole sets may also be required. This generally involves excavation of four trenches (approximately 2 m x 2 m x 1.8 m – 2m deep) at a distance of at least 10 m from the pole set, though this distance can often be larger. Pre-cast concrete stay blocks, or wooden sleepers are placed at the base of these excavations and stay wires are affixed to them before the excavation is reinstated.
110 kV angle mast	Where a change in conductor direction of more than 20 degrees is required, steel lattice towers are used. These are typically smaller in scale than the higher voltage versions and range in height, typically starting at 15 m and increasing in increments of 3 m extensions, depending on topography (smaller 12 m masts can also be erected in some circumstances).	Concrete foundations are required for all steel towers, and pile foundations may be required in unstable ground. The average foundation block size for each tower leg used in the 110 kV towers is 4 m x 4 m x 3 m.

For all transmission lines with earth (shield) wires, there is a requirement to install an earth ring or mat at the base of the structure to ground the structure for safety reasons. The ground around the base of the structure is excavated while the respective tower or pole set is being erected and the earth ring is subsequently installed before completion of works at the site.

2.5.1.1.2 Construction Methods

Transmission line construction, maintenance and decommissioning usually follows a standard sequence of activities. The duration of these activities for 110 kV transmission lines (wooden pole support structures) is normally less than for higher voltage lines requiring lattice steel towers. The construction of high voltage transmission lines typically entails the following sequence of events:

1. Preliminary procedures including verification that planning conditions have been satisfied; pre-construction site investigations including an access review and assessment of ground conditions; delineation of on-site working area.
2. Establishment of temporary access routes and laydown / storage areas, where necessary.
3. Setting out of tower foundations or pole excavations.
4. Installation of foundations, as appropriate.
5. Erection of towers or pole sets.
6. Stringing of conductors and commissioning.

7. Reinstatement of land.

8. Removal of temporary access.

2.5.1.1.3 Construction Access

To minimise environmental disturbance, access to individual structure locations is generally along the local public road network, with subsequent works access to private land using existing farm entrances and tracks wherever possible. Access routes are typically marked or fenced on site to keep disturbance to a minimum. Specific planning conditions relating to access routes may also apply.

Off-road access is assessed prior to works. In peatland areas, access is achieved by using wide tracked low ground pressure vehicles to minimise damage to ground, and in sensitive areas may be combined with bog mats made from timber (or other preformed matting such as aluminium or Ethylene Propylene Diene Monomer (EPDM) sheets). Where very soft ground is encountered, temporary access tracks may need to be constructed. Generally, temporary roads are constructed using stone; however, in certain sensitive situations, aluminium road panels may be used.

Stone road construction involves the stripping and preservation of surface turves followed by excavation of the topsoil and storage of this to one side of the track. Geotextile reinforcement is placed on the subsoil surface and approximately 200 mm of stone placed on top and compacted to form the track. Alternatively, in soft bog, a stone or panel road as described above may not be appropriate and in this case timber sleepers can be used.

Where extremely sensitive habitats occur or where access is particularly challenging, materials can be airlifted to the respective work site using a helicopter.

2.5.1.1.4 Refurbishment and Uprating

Transmission lines are generally low maintenance utility infrastructure. Refurbishment works are generally required for transmission lines that have been in place for over 20 years. Refurbishment works may consist of a major overhaul of equipment, to rebuild or replace parts or components of a transmission asset to restore it to a required functional condition and extend its life. Refurbishment comprises the replacement of individual towers, pole sets, insulators or hardware at selected locations and the replacement or strengthening of selected angle tower foundations.

Existing transmission lines can also be uprated to increase capacity or strengthen electrical resilience in the system. Uprating involves the replacement of the overhead line / conductor with a more efficient conductor of the same voltage and usually involves the replacement of a significant number of support structures as the new conductor may be heavier than the original.

In general, the work associated with refurbishment and uprating of transmission lines can include some, or all, of the following:

1. Fittings replacement – this involves removal of existing fittings, followed by installation of new fittings. These include smaller scale items such as brackets, insulators, and clamps.

2. Replacement of crossarm and fittings – this involves removal of crossarm and fittings, followed by installation of new crossarm and fittings (110 kV only).

3. Replacement of intermediate pole set structures - this involves removing all associated fittings, stays (where present), cutting and removal of the poles, followed by installation of new poles, stays, crossarm and fittings.

4. Replacement of steel towers - this involves the removal of the existing structure and all associated fittings, and the removal of the existing foundations, followed by the installation of new foundations and construction of new structure and installation of fittings.

5. Replacing the conductor - this involves re-stringing by pulling the conductor between the angle masts, with the main element of this work carried out at angle masts, with some work also carried out at strain and semi-strain locations during conductor stringing (uprating).

6. Other ancillary works - such as guard posts for road crossings, diversions of lower voltage lines, erection of temporary structures, etc.

In some instances, intrusive site investigation works are required to determine the level of work required as part of an uprate or a line refurbishment. The foundations of existing towers often require assessment. This is typically undertaken using *dynamic probing*, which is a penetration test that provides information on the geo-technical properties of the ground around a structure. In addition, a partial excavation of one or more tower legs may be required to determine the suitability of the existing tower.

2.5.1.1.5 Construction Resources

Table 2-5 outlines the types of structures and equipment typically used during the construction, uprating or refurbishment of overhead transmission lines.

Table 2-5 Summary of works and resources involved in the construction, uprating and refurbishment of overhead line infrastructure

Works	Summary	Plant required for construction
	Construction	
275 kV tower construction	Design: The height range of towers is generally between 20 m and 52 m depending on topography. The maximum width of the towers at ground level ranges from 7 m to 12 m. The average span between towers is, on average, approximately 350 m, dependent on local topography. Foundation: There are four concrete foundations installed per steel structure. Foundation size and type is dependent on ground conditions and tower type but is typically 2.8 to 5.3 m in width for each foundation pad. The base installation time is approximately one week. A larger footing may be required in the case of weak soils, while pile foundations can be used in the case of deep peat. In the case of rock being encountered at shallow depths, reduced footing size foundations may be required. Shear blocks (i.e., a protective concrete neck around the base of tower legs) are poured once the main foundations are in-situ. Erection: Towers are generally constructed using a 'derrick pole' or a mobile crane. The derrick pole methodology is a simple system wherein small sections of steel are lifted into place using the derrick pole and a winch. The derrick pole consists of either a solid or lattice aluminium or steel pole which is held in position using guy ropes anchored to the ground. The crane-based procedure entails the tower being completed in separate sections due to the weight of the differing components. Tower sections are assembled on the ground and subsequently lifted into place.	Transit van 4x4 vehicle Winch tractor Tractor and trailer Crane/Derrick pole Teleporter Chains and other small tools Concrete vibrator Water pump Wheeled/ track dumper Excavator Concrete trucks
220 kV tower construction	Design: The height range of towers is generally between 20 m and 40 m depending on topography. The maximum width of the towers at ground level ranges from 6 m to 12 m. The average span between towers is, on average, approximately 320 m, dependent on local topography. Foundation & Erection: Broadly follows the 275 kV specifications and construction methodology. There are four concrete foundations	As for 275 kV

	installed per steel structure. Foundation size and type is dependent on ground conditions and tower type but is typically 1.4 m to 3.8 m in width for each foundation pad.	
110 kV pole set construction	Design: The height range of pole sets is generally between 16 m and 23 m depending on topography. The maximum width of the pole sets at ground level ranges from 4 m to 9.8 m. The span between pole sets can range from 180 m to 300 m, dependent on local topography. Installation: An excavation of a minimum of 2.3 m for each pole is carried out using a wheeled or tracked excavator. Each of the two poles are lined up with the excavated holes and the machine operator then drives forward pushing the pole up until the pole is in an almost vertical position. The pole is always supported, and the holes manually backfilled to a minimum depth of 1 m. After excavation and erection of the pole set, a further excavation 0.8 m deep is necessary. This is a linear excavation perpendicular to the line necessary to install wooden sleepers. These sleepers add additional stability to the pole set and are attached to the pole set using a u-bolt.	Transit van Excavator Winch tractor/pole erector Chains and other small tools
110 kV pole set stays	Under certain ground conditions, stay wires may be required at some pole set locations to provide stability to the structure. These wires add stability to the pole and are supported by means of stay blocks and/or timber sleepers. The stay blocks are made of concrete and are buried underground, as are the timber sleepers should they be employed. Stay foundations are installed at a distance of at least 10 m from the pole set, though this distance can often be larger.	As for 110 kV pole set construction
110 kV angle tower construction	Refer to 220 kV; towers are smaller in scale, with a height range of 18 m to 24 m.	As for 275 kV tower construction
	Refurbishment / Uprating	
Replace fittings	Fittings, insulators (where required) and equipment can be transported to site without the use of heavy equipment.	(Tracked) Quad bike and / or buggies Chains and other associated tools
Replace crossarm and fittings	Crossarms link the wooden pole sets and the fittings and conductor are attached to the crossarm. They are long heavy metal structures, and their removal requires a mobile elevated work platform (MEWP) and tracked excavator to provide a safe working platform.	4 x 4 vehicle (not used within sensitive areas) Mobile elevated work platform (MEWP) (Tracked) quad bike / buggy Tracked excavator (also used to carry in/out new/old crossarm) Chains and other associated tools.
Replace intermediate pole set structures	The replacement of wooden pole sets is undertaken in situ with the replacement structures erected immediately adjacent to the original structure. Once the conductor has been removed from the old pole set and moved on the new support, the two original wooden poles are cut at ground level and removed from site. Alternatively, the old poles may be fully removed from the ground, with the new poles being installed in the same position.	2 no. 360˚ tracked excavators Winch Tractor Quad bike

Replace angle mast structures	Requires temporary installation of wooden pole sets to accommodate conductor (see above). Excavation and replacement of lattice tower and foundations then proceeds (refer to 275 kV construction).	Refer to 400 kV
Replace conductor	Stringing of the conductor is undertaken in sections between end mast and angle mast or between angle masts. Stringing normally requires the placement of puller tensioners outside the span of the line section. A variation of this can occur when the location of the puller tensioner is constrained by environmental or ground conditions. In such cases back stringing is utilised; this is where one puller tensioner is located in the span area rather than outside it. The methodology involves connecting the new conductor to the existing conductor using stringing stockings and pulling out through the section in question. The methodology involves the pulling of a light pilot line (nylon rope) which is normally carried by hand into the stringing wheels. This in turn is used to pull a heavier pilot line (steel rope) which is subsequently used to pull in the conductors from drum stands using specifically designed 'puller-tensioner' machines. The temporary working areas utilised for the stringing equipment are generally 20 m x 20 m. Once the conductor has been pulled into position, one end of the straight is terminated on the appropriate tension fittings and insulator assemblies. The free end of the straight is then placed in temporary clamps (referred to as 'come-alongs') which take the conductor tension. The conductor is then cut from the puller-tensioner and the conductor is sagged using a chain hoist. The conductor is kept clear of all obstacles along the straight by applying sufficient tension. Certain obstacles along a straight must be guarded, such as road/railway crossings and other transmission or distribution lines. Before removal in such cases, the conductor must be terminated at each end before being clamped in on either side of the obstacle crossing. Once the conductor is connected to the angle masts, the temporary poles are then removed.	4x4 vehicles 2 no. Puller - tensioner 2 no. Teleporter 2 no. Drum stands 2 no. Drum carriers Stringing wheels Conductor drums Compressor & head Transit vans Chains and other small tools Conflict guardings
Access to works areas		
Tower & pole set construction	Excavators are generally tracked to reduce likely damage to, and compaction of, the ground. In addition, a temporary hard standing may be required for machinery, and this may require the removal of topsoil. Bog mats, either of timber, aluminium or rubber construction are used to access structures in poor ground conditions or in ecologically sensitive areas. At some locations, temporary roads with stone or wooden sleepers may need to be constructed. This involves the excavation of the topsoil and storage of this to one side of the track; surface turves are preserved for later reinstatement. A geotextile reinforcement is placed on the subsoil surface and stone placed on top and compacted to form the track. All material for temporary tracks is removed following completion of works. Materials required for construction are transported around the site by general purpose, cross-country vehicles with a lifting device.	

Refurbishment & uprating	Machinery access protocol is as for construction above. In the case of replacement of fittings, where no specific machinery is required, works crews access the site on quad bikes (tracked on soft ground) or on foot.

An illustrative guide to the construction of 400 / 275 / 220 kV towers is presented in **Figure 2-2**.

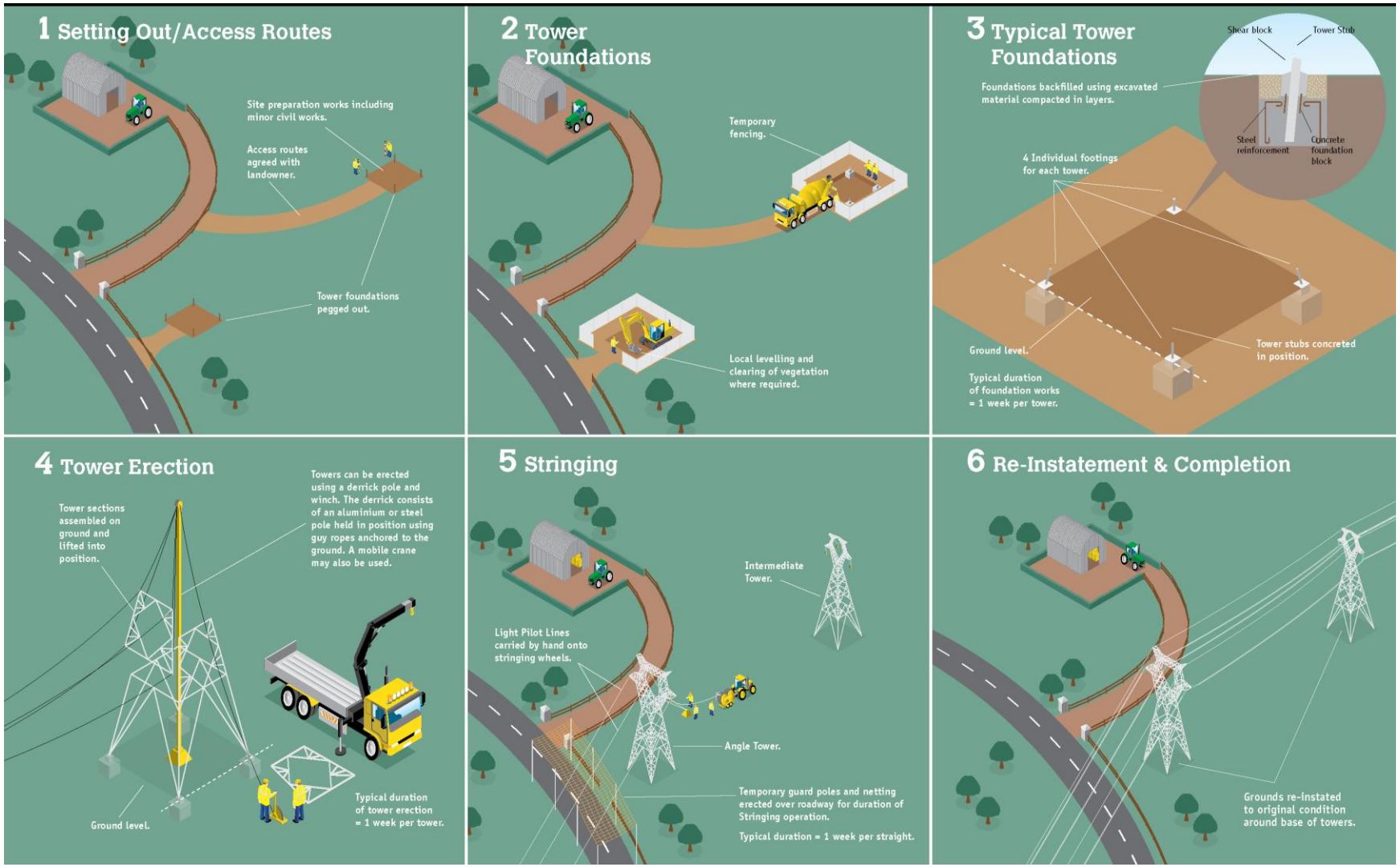


Figure 2-2 Graphic guide to transmission tower construction

2.5.1.2 Underground Cables

2.5.1.2.1 Construction Methods

High voltage (HV) circuits can only be laid underground using special HV cables designed specifically for underground use. The conductors in underground HV cables must be heavily insulated to avoid a short circuit between the conductor and the ground around the cable.

Cables are installed directly into the ground in an excavated trench. Typically, high voltage cable routes are located along public roads and open spaces. In some instances, a cable route may be required to cross private open ground.

Transmission cable routes comprise sections of cable that are connected using a cable joint. Cable joints are installed in *joint bays*, which are typically concrete structures buried underground, occurring every 500 - 700 m along an alignment, and ranging in size up to 6 m long, 2.5 m wide and 1.8 m deep.

Once installed, the road surface is reinstated. Where a cable route is in an open area, it is returned to agricultural / grassland use. Where a cable passes through forested land, the route is not replanted with trees to prevent any damage to the cable by tree root growth.

2.5.1.2.2 Watercourse Crossings

Where cable routes transect watercourses, specific crossing methods are required. In cases where the cable is being trenched along a public road and there is adequate overburden in the deck of a bridge at the point of crossing, it is generally feasible to continue the cable over the bridge without any need for off-road or in-stream works.

Where the above approach cannot be facilitated, the remaining options are *open-cut* trenching across the bed of the river or trenchless technology wherein a cable duct is installed at a defined depth under the riverbed without any requirement for disturbance of the water column or bed substrate.

Open cut crossings are typically achieved by damming and pumping / fluming of the water flow around the trench excavation. A section of the watercourse is temporarily dewatered via upstream and downstream damming of a defined stretch with sandbags to ensure that all works are undertaken ‘in the dry’. It may be necessary to temporarily remove fish from the reaches involved using electrofishing equipment, which should only be undertaken by relevant fisheries staff or qualified aquatic ecologists. Water is diverted from upstream to downstream of the cable crossing location by means of a secure open flume arrangement, through piping, or in limited circumstances, by means of over pumping. Screening to prevent aquatic organisms entering pumps is a requirement in the case of the latter option. Where concrete ballast is used to prevent cable ducts rising due to buoyancy, these should comprise precast concrete. As this methodology involves direct in-stream works, to minimise potential impacts it should be scheduled for the period of July - September and undertaken in line with the relevant fisheries guidelines. Following the completion of backfilling, riverbed and riverbanks should be reinstated to match their original profile and substrate material. These works are temporary in nature and are typically limited to 1-2 days.

Horizontal Directional Drilling (HDD) is a trenchless technology, which can be undertaken in a relatively confined area, such as on or adjacent to a public road or parallel to a bridge, therefore minimising the degree of off-road works required at watercourse crossings. Additionally, works do not have to be restricted to the July - September window which applies to the open cut method. A drilling rig is established at a ‘launch pit’ on one side of a watercourse, from where it drills along a curved profile under the bed of the watercourse, and subsequently to a ‘reception pit’ on the far side. A reaming head and toe clamp is then attached to the leading drill rod, which then returns to the drilling rig, widening the bore and pulling the cable duct along in the process. The launch pit for the drilling rig typically requires the temporary installation of a level hardstanding area on a geotextile base; the footprint of this working area can vary from site to site but on average is typically 10 m x 10 m. Silt fences are erected between the launch and reception pits and the watercourse. During drilling, lubricant fluid is pumped into the bore from a bowser/mixing unit which is typically retained within a vehicle on the public road or on level ground set back from the watercourse. Specific non-toxic drilling lubricants are available for use under watercourses.

2.5.1.3 Substations

Substations connect two or more transmission lines; they take the electricity from the transmission lines and transform higher to lower voltage, or vice versa. Substations contain various electrical equipment, including voltage switches, transformers, protection equipment, and associated lines and cabling.

The siting of a substation depends on topography, as the ground must be suitable to meet technical standards. Owing to earthing requirements and soil stability, substations are usually constructed on reasonably level ground, in areas that are not liable to flooding or crossed by significant watercourses.

Air Insulated Switchgear (AIS) substations are those where the electrical equipment infrastructure is primarily installed outdoors, with the use of natural air as an insulation between circuits. This option requires a relatively large compound footprint (e.g., a typical 400 kV AIS substation compound may occupy up to 4-5 hectares, excluding surrounding access and landscaping).

Gas Insulated Switchgear (GIS) substations are those where gas (Sulphur Hexafluoride – SF_6) is used as the insulation between circuits. This requires the electrical equipment to be contained internally, in buildings typically 11 m to 13 m in height above ground. This allows for a significantly smaller substation footprint (e.g., a GIS substation with the same capacity as the 400 kV AIS substation described above would occupy approximately 1 hectare, excluding surrounding access and landscaping).

Both AIS and GIS substation options require the associated provision of access roads off and onto the public road network and the provision of associated electrical equipment and infrastructure (including underground cables). Surface water drainage infrastructure from buildings and other substation elements also needs to be installed. In the case of oil-filled transformers, these are constructed on bunded plinths comprising water pumps with oil sensors that deactivate pumping when oil is detected.

Ancillary wastewater treatment facilities, palisade fencing around boundaries, and other site development and landscaping works also occur during the development of substations. These should therefore be considered as significant civil engineering projects.

Plan option details also include the upgrade or extension of existing substations.

3 BASELINE AND ENVIRONMENTAL ISSUES

In line with the SEA Directive, this section describes the environmental baseline for the draft TDPNI area. This includes: a description of the state of the environment at present; a discussion of the key problems/issues currently being faced in the area; and a description of the expected evolution of the environment should the TDPNI not be implemented, i.e., in the absence of the Plan.

The baseline description focuses in the first instance on Northern Ireland, however given the shared land boundary with the Republic of Ireland, there may be potential for environmental impacts on water quality, air quality, biodiversity etc. in the Republic of Ireland. As such, the baseline description also includes reference, where relevant, to conditions in the Republic of Ireland.

3.1 Current State of the Environment in Northern Ireland

Northern Ireland's most recent full state of the environment review (2013)[9] found the situation to be variable. Air quality shows continuing improvement, while water quality has benefitted significantly from improved control of effluents, and rates of municipal waste recycling have been steadily increasing. Significant challenges remain, however, in reversing biodiversity declines and meeting EU objectives for water bodies, landscapes, habitats and heritage.

The main threats identified in the previous 2008 review, namely climate change, land use, and socio-economic growth, continue to create pressures on the environment in Northern Ireland. These key challenges are outlined below:

- Economic downturn –

The most significant change since 2008 with regards to socio-economic growth has been the economic downturn, which has had impacts on housing, development, energy and resource use and on waste production. The 2008 recession has intensified the need to stimulate growth and to use our resources, such as agricultural lands more efficiently whilst protecting and enhancing our natural environment.

- Living within our limits –

Living within our limits relates to the impact of ever-increasing populations on the environment in terms of food production, imports, energy use, and water security. There is an increasing realisation that living within our limits, both economically and environmentally, locally and globally, is now a major challenge.

- Sustainable rural land use –

It has been identified that the marine environment, from biodiversity indicators and the status of our waters are under threat. The 2013 State of the Environment report[10] notes the relationship between rural land practices and the water environment and identifies that a fully integrated approach to management of the land and water environment is needed.

- Climate change –

Climate change remains an important issue for Northern Ireland and indeed globally. However recent legislation such as the UK Climate Change Act along with renewable energy policies and increasing energy costs are likely to contribute to already positive advancements.

[9] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

[10] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

Following on from the key challenges identified, three key principles underpinning the way forward were also listed in the state of the environment report, and comprise the following:

- Working to achieve **resilient, diverse ecosystems** capable of providing vital services while absorbing pressures and responding to change;
- Valuing and **managing natural resources** to support economic and social prosperity; and
- Protecting the quality of life by **reducing pollution, protecting heritage** and promoting **sustainable land use**.

A summary of the relevant aspects of the current state of the environment in Northern Ireland, as presented in the most recent state of the environment review (2013) and updated, where possible, by taking into account the most recent Northern Ireland Environmental Statistics Report (2023)[11], has been provided in **Table 3-1**.

Table 3-1 Summary of Current State of the Environment in Northern Ireland, as presented in 'From Evidence to Opportunity: Second assessment of State of NI Environment 2013' and updated by the 'NI Environmental Statistics Report 2023'.

Theme	Key Findings
Air Quality	There are 21 air quality monitoring stations in Northern Ireland. Air quality in Northern Ireland has shown substantial improvement in recent years. The average annual mean concentration of NO_2 across Northern Ireland's urban background sites remained relatively stable between 2011 and 2016, varying between 20 and 23 µg/m^3. However, since 2017 the average annual mean concentration of NO_2 has fallen below this level and was 13.6 µg/m^3 across Northern Ireland's urban background sites in 2022. In 2022, there was no breach of the UK Strategy Objective or EU Limit Values of 40 µg/m^3 for the annual mean concentration of particle matter (PM_{10}). The annual mean PM_{10} concentration across Northern Ireland's urban monitoring sites reached a maximum of 22 µg/m^3 (in 2010) but has shown a gradual decline since that time, with an annual mean value of 14 µg/m^3 in 2022. The agriculture sector accounted for the majority of ammonia emissions in Northern Ireland in 2021. Other sources include transport, commercial and domestic combustion and industrial processes. Overall, ammonia emissions have increased, by 12.1%, from 28.5 kt in 2001 to 32.0 kt in 2021.
Climate	Since the start of the 20th century records show that the climate in Northern Ireland is changing. In 2020, Northern Ireland's greenhouse gas emissions were estimated to be 20.9 $MtCO_2e$, a reduction of 24% since baseline levels in 1990. Agriculture (27%), transport (16%) and residential (14%) were the largest contributing sectors to greenhouse gas emissions in Northern Ireland in 2020. The UK Climate Change Act commits the UK to reducing emissions by 100% by 2050 from 1990 baseline levels. The same 100% emission reduction target is now true of Northern Ireland, due to the Climate Change Act NI, as of June 2022. In 2020, Northern Ireland's total greenhouse gas emissions accounted for 5% of the UK total, higher than its population share of 3%. For the period January to December 2022, 50% of the total electricity consumption in Northern Ireland was generated from renewable sources based in Northern Ireland.

[11] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ni-environmental-statistics-report-2023.pdf

Water	Eutrophication, or the enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus is recognised in the State of the Environment Report 2013 as a widespread major threat to water quality in the freshwater environment. The report stated that the overall status of water bodies in Northern Ireland had not significantly changed from that recorded in 2012, but improvements had been identified in water utility discharges and drinking water quality. Long-term seasonal trend analysis reported in the State of the Environment Report 2013 showed that the monthly trends in average nitrate concentrations in rivers in Northern Ireland were predominantly decreasing or stable over the 28-year period, 1992-2019, which may be attributed to the measures implemented through the Nitrates Action Programme. However, DAERA issued a consultation document on Significant Water Management Issues[12] to inform the development of the third cycle River Basin Management Plan (2021-2027). This showed that the most significant pressure on water quality in Northern Ireland is from the release of the nutrients not only nitrogen but also from phosphorus, from agricultural and other sources. Between 2015 and 2018, Soluble Reactive Phosphorus (SRP) was the cause of decline in status for 100 river water bodies across Northern Ireland. It should also be noted that The Programme for Government (PfG) Outcome 2 indicator includes SRP concentrations in rivers. In 2022, there were 1,535 water incidents reported to NIEA or discovered by NIEA during inspections. Of these incidents, 44% were confirmed as having an impact on the water quality of the receiving waterway, with 13% of these considered as high or medium severity.
Marine	The majority of Northern Ireland's 650 km of coastline is protected for its special interest, and a number of our coastal species and habitats are recognised as internationally important. Of the 25 inshore coastal waterbodies in Northern Ireland, 13 were reported as good or better ecological condition. High nutrient levels, particularly in inshore estuarine waters and sea loughs, are identified as a key element responsible for coastal water bodies not attaining good ecological condition. In January 2014, the Shellfish Waters Directive was subsumed into the Water Framework Directive, resulting in more stringent *E. coli* standards and a noticeable "drop" in the percentage of designated shellfish waters. Two out of nine (22%) designated shellfish water protected areas (SWPAs) complied with the Water Framework Directive guideline *E. Coli* standard in Shellfish Flesh in 2022, a decrease from a percentage compliance of 56% in 2021.
Land and Landscape	Agri-environment schemes encourage farmers and landowners to manage their land to benefit the environment. At the end of 2022, 63,800 hectares of land in Northern Ireland were under an agri-environment scheme agreement. In Northern Ireland, over 52% of forests and woodlands are state-owned or managed. The NI Environmental Statistics Report 2023, reported that in 2022/23, 451 hectares of new woodland (72 ha conifer and 379 ha broadleaf) were planted by NI Forest Service and private landowners supported by grant aid.
Biodiversity	The Northern Ireland Environmental Statistics Report 2023 reported that in 2021/22, the area of terrestrial protected sites under favourable management in Northern Ireland was recorded as at least 35,896 ha. In 2022/23, 55% of features within marine and terrestrial protected sites were in Favourable condition while 36% were in Unfavourable condition. Approximately 3% were in Unfavourable-Recovering condition with less than 1% Destroyed. The wild bird population indicator using 56 bird species shows decreased levels in 2021 compared to 1996. Bird populations peaked in 2005 and have been in decline since, driven principally by bird species found in farmland habitats.

[12] https://www.gov.ie/pdf/?file=https://assets.gov.ie/78373/30d96d3b-a09c-431c-a3ee-790668e35e57.pdf#page=null

Built Heritage	In 2021/22, there were a total of 2,019 scheduled historic monuments protected under Article 3 of the Historic Monuments and Archaeological Objects (NI) Order 1995. Overall, there has been a 33% increase in the number of scheduled monuments since 2001/02, reflecting ongoing survey, designation and assessment. In addition, there has been a modest increase in the number of buildings listed in recent years with a total of 9,063 statutory listings in 2021/22, compared with 8,191 in 2003/04. The figures provide an indication of this aspect of the rich cultural and built heritage of Northern Ireland, an increasingly important source of "soft power" and an important contributor to the Northern Ireland economy, through attracting tourism and filming. In 2021/22, 892 historic buildings and structures were recorded on the HARNI register as 'at risk'.
Waste and Resources	Waste is produced by households, by industrial processes, by the construction and demolition industry, through commercial activities and agricultural practices and by public services and utilities. Waste can affect the environment through its visual impact or by emissions to the air, groundwater and surface water as well as the contamination of land. The Northern Ireland Environmental Statistics Report 2023 notes that The Local Authority Municipal Waste Management Statistics show that amount of waste sent for energy recovery via incineration has grown exponentially since 2006-07, whilst the proportion of waste sent to landfill has more than halved in the same timescale. Recycling of waste is becoming much more common in Northern Ireland. The revised Northern Ireland Waste Management Strategy (Delivering Resource Efficiency, 2013) proposed to achieve a 50% recycling rate by 2020 for local authority collected municipal waste. For municipal waste in 2021/2022 the recycling rate was 49.7%, similar to the 50.0% rate for 2020/21. The recycling rate for household waste was 50.1% in 2021/22, which was a decrease compared to the 2020/21 rate of 50.9%.

3.2 Current State of the Environment in the Republic of Ireland

A summary of the current assessment and outlook for the Republic of Ireland across key relevant environmental policy areas, as presented in the most recent State of the Environment report (Ireland's Environment 2020 – An Integrated Assessment[13] SOER2020), has been provided in **Table 3-2**. The next State of the Environment review is due to be published in 2024.

Table 3-2 Summary of Current State of the Environment in the Republic of Ireland

Policy Area	Overall Assessment
Climate	While there has been some progress on renewable energy and ambitious climate action and adaptation plans, the Republic of Ireland's failure to significantly reduce GHG emissions results in a 'very poor' current assessment. GHG emissions in Ireland increased by 10.1 per cent from 1990 to 2019. The latest projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25 per cent by 2030 compared with 2020 levels. Meeting 2030 targets and the 2050 transition objective will require the full implementation of current policies and measures, and significant national investments. Chapter 2 of the SOER2020 highlights that both the scale and pace of GHG emissions reductions need to accelerate, and that this will necessitate far-reaching and transformative change across the whole economy, including agriculture. This is likely to be particularly challenging for the agriculture sector, with the GHG

[13] https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/irelands-environment-2020---an-assessment.php

	national emissions profile indicating that over one-third of emissions come from this sector, and that emissions in 2019 were 9.5% above 1990 levels, mainly driven by a 16.1 per cent increase in methane emissions from enteric fermentation and a 21.8 per cent increase in emissions from manure management. The Climate Action Plan states that Ireland cannot achieve its climate targets without the necessary reductions from the agriculture sector, and that policies and measures underpinning these reductions should be prioritised to ensure full delivery of the necessary reductions. In addition, Chapter 2 of the SOER2020 states that Ireland must also maximise the use of land as carbon stores, for example through grasslands, wetlands and forestry, to meet emission reduction targets.
Air	While overall air quality in the Republic of Ireland is good, there are localised issues with some pollutants (such as particulates) that have serious potential health impacts, resulting in an overall current assessment of 'moderate'. The latest estimates indicate that over 1300 premature deaths occur in Ireland annually as a result of poor air quality. The Republic of Ireland is generally meeting EU air quality limits but not some WHO guideline values in places, and nitrogen oxides exceedance in 2019 is a warning about not being complacent in tackling air pollution. Chapter 3 of the SOER2020 states the Republic of Ireland is not on track to meet National Emission Ceilings (NED) Directive targets for ammonia, owing to emissions from agriculture. This sector accounts for practically all (99%) of ammonia emissions in Ireland, with emissions increasing each year. Ammonia emissions can lead to the formation of secondary particulate matter, acidification and eutrophication. There has been mixed progress in reducing overall emissions from transport and energy. Overall, the Republic of Ireland's prospect of meeting targets and policy objectives is heavily dependent on the implementation of agreed national measures.
Nature	Overall current assessment is 'very poor'. Deteriorating trends dominate, especially for protected habitats. Chapter 6 of the SOER 2020 states that the main pressures on protected habitats in Ireland are agriculture and other land uses such as resources extraction (including minerals and peat), forestry, urbanisation, recreation and invasive species and that, unless action is taken now, it is likely that pressures relating to agriculture, climate change and invasive species will remain the same or increase. Changes in the intensification of agricultural practices (including land drainage, fertiliser application, clear-felling, undergrazing and land abandonment) have impacted on biodiversity, including a decline in pollinators and other insects. In the absence of far-reaching measures, the outlook is largely not on track for meeting policy objectives. Transformative change will be required to alter the current biodiversity loss trends. A key policy driver for biodiversity protection for the next decade will be the new EU Biodiversity Strategy for 2030. The SOER 2020 recognises a need to encourage farming practices that restore and enhance biodiversity through agricultural policies and schemes.
Water	As outlined in Chapter 7 of the SOER2020, nearly half of the surface waters in Ireland are failing to meet legally binding water quality objectives, as set by the EU WFD as a result of pollution and other human disturbance. Overall, current assessment is 'poor'. Trends are mixed, with serious declines in pristine river sites from 500 in 1990 to just 20 in 2020. The SOER 2020 identifies agriculture as the most significant pressure on water bodies in Ireland, and that a significant response is required from this sector to reduce its impact. In terms of outlook, significant challenges remain to achieving full compliance and meeting policy objectives. The SOER identifies a need for tighter measures to be covered in the next RBMP and the Nitrates Action Programme to mitigate the impacts from fertiliser spreading, slurry spreading and other nutrient losses.

Land and Soil	In Ireland, land use, land use change and forestry (LULUCF) is currently a net source of CO_2, which must be reversed so that land is used to store carbon to meet GHG reduction and carbon neutrality targets. In terms of pressures, Chapter 5 of the SOER 2020 states that urbanisation and building account for some of the biggest losses of soil areas in Ireland, while soil compaction is also a recognised key threat to the quality of Irish soils. There is a lack of specific legislation protecting soils in Ireland, with the exception of legislation regarding key habitats and ecosystems that are associated with peat soils, and site-specific regulation that associated with industrial and waste facilities. The latest CORINE land cover mapping of Ireland indicates recent changes in land use patterns, including a long-term downward trend in wetland areas (with a 20% reduction in area since 1990). Agriculture is the dominant national land cover type, representing almost 68% of the national area in 2018. Many peatlands are in an unfavourable state, including those protected under European and national legislation; if restored, these could play a key role as carbon sinks and provide space for nature. Forestry is expanding, and forests are expected to play a larger role in carbon storage in the future, however environmental assessments are key to ensuring that the right development and management of these areas is implemented.
Waste and Circular Economy	Overall current assessment is 'poor'. While the Republic of Ireland is meeting current targets, recycling rates for municipal waste and packaging have levelled off and, in some cases, declined. Waste generation remains high and is linked to economic activity, while circular use of material remains very low. Publication of new national waste policy is welcome. Achieving future EU targets and circular economy goals will be dependent on rigorous implementation of waste legislation, policy initiatives and measures.
Environment and Agriculture	Chapter 13 of the SOER 2020 specifically covers the relationship between the environment and agriculture in Ireland. The agri-food sector plays a significant role in Ireland's economy, as well as its landscape and environment. Farms in Ireland cover almost 68% of the country's land area, and vary in both size and type of production, with most farmers involved in livestock farming. The agriculture sector in Ireland contributes to a wide variety of pressures. Significant pressures on the environment have occurred as a result of agricultural expansion arising from FoodWise 2020, a 10-year overarching strategy for the agri-food sector. The SOER 2020 states that these increased pressures need to be mitigated urgently, and resolved, in order to meet EU legislative requirements. This includes air pollutant emissions (particularly ammonia), GHG emissions, water quality, and biodiversity decline. Agricultural on-farm practices were accountable for almost 33% of national GHG emissions in 2018, primarily consisting of methane and nitrous oxide, with the increasing trend in emissions largely determined by the size of the national cattle herd and application rates of nitrogen fertilisers. In the absence of abatement measures, projections for the sector suggest that GHG emissions will continue to grow, mainly as a result of increases in the size of the dairy herd. Implemented and planned policies and measures are not considered likely to alter the status of the sector as a significant contributor to national GHG emissions. Ammonia emissions in Ireland are almost exclusively attributable to the agriculture sector, accounting for 99% of the national total in 2018. The SOER 2020 identifies the need for significant implementation of on-farm abatement measures to bring Ireland into compliance with the current national emission ceiling, and to meet the 2030 emission ceiling for this pollutant. The sector is also the second largest source of nitrogen oxide emissions in Ireland (contributing >32% of the 2018 total), with emissions mainly associated with synthetic fertiliser application, urine and dung deposited by grazing animals and the application of manures to soils, and also the largest source of NMVOC emissions (>39% of the 2018 total), associated with manure management and fertiliser application, and is also responsible for >7% of national emissions of particulate matter.

As outlined above for 'Nature' and 'Water', changes in agricultural practices, and their intensification, have led to impacts on biodiversity and water quality. Reducing agricultural impacts on water quality requires interventions that are urgent, coordinated and evidence based. Under the current (2018-2021) RBMP, actions are being targeted within 190 'Areas for Action'; where agricultural activities are impacting water quality within these areas, farm sustainability advisors under the Agricultural Sustainability Support and Advice Programme (ASSAP), are working with farmers to identify the problems and implement the right measures in the right places.

The Key Messages put forward in the SOER 2020 are as follows:

- ***SOE1 Environmental Policy Position***: A national policy position for Ireland's environment. *Actions:* There are many interlinkages and dependencies between environmental policies and legislation. These links could be better connected and reinforced through an integrated national policy position on protecting Ireland's environment.

- ***SOE2 Full Implementation***: Full implementation of existing environmental legislation and a review of the governance around the coordination on environmental protection across public bodies. *Actions:* Full implementation of, and compliance with, existing environmental directives and legislation is a must to protect the environment. A review of environmental governance is needed to develop structures to achieve full implementation. This review should also develop recommendations for governance structures that help with improving coordination and linking up environmental protection work across different departments, organisations and regulatory bodies.

- ***SOE3 Health and Wellbeing:*** Protecting the environment is an investment in our health and wellbeing. *Actions:* Managing the environmental and radiological risks to health from chemicals and other pollutants is still a major part of environmental protection. Green and blue spaces as well as quiet areas also need to be protected as they provide social spaces for communities and enable a connection to nature, with evidence showing that spending time in such spaces is good for health.

- ***SOE4 Climate:*** Systemic change is required for Ireland to become the climate-neutral and climate-resilient society and economy that it aspires to be. *Actions:* More urgency is needed to deliver actions on climate mitigation and adaptation and to ensure that Ireland meets its international obligations to reduce GHG emissions. While Ireland's GHG emissions, with full implementation of the Climate Action Plan, are projected to decrease by an annual average reduction of 3 per cent between 2021 and 2030, further measures are required to meet national and EU ambitions to keep the global temperature increase to 1.5°C.

- ***SOE5 Air Quality:*** Adoption of measures to meet the WHO air quality guideline values should be the target to aim for in the Clean Air Strategy. *Actions:* The publication and implementation of the planned National Clean Air Strategy is needed to protect Ireland's air quality. The adoption of the WHO guideline values as national air quality standards within the strategy would provide for a higher level of public health protection. Integrating air pollution controls, noise mitigation measures and climate action, for example in transport management, can bring multiple benefits.

- ***SOE6 Nature:*** Safeguard nature and wild places as a national priority and to leave a legacy for future generations. *Actions:* Nature and wild places are at risk in Ireland and need to be better safeguarded, both locally and in protected areas. The next Biodiversity Action Plan needs to be more ambitious and identify the pathway to transformative change for nature protection in Ireland. It needs to develop and further strengthen the protection of our national network of protected areas for future generations and to reverse wider current trends in biodiversity and habitat loss.

- ***SOE7 Water Quality:*** Improve the water environment and tackle water pollution locally at a water catchment level. *Actions:* The water quality in Ireland's rivers, lakes and estuaries needs to be better protected through evidence-based measures, integrated water catchment-based projects and initiatives, and by reducing the amount of nutrients ending up in water courses.

- ***SOE8 Marine:*** Reduce the human-induced pressures on the marine environment. *Actions:* As an island nation with an extensive marine area, Ireland needs to ensure that robust governance and legal frameworks are in place to protect the marine environment.

- ***SOE9 Clean Energy:*** Ireland needs to move rapidly away from the extensive use of fossil fuels to the use of clean energy systems. *Actions:* The emissions from the combustion of mainly imported fossil fuels are damaging for our health and our environment and drive climate change. The transition from reliance on fossil energy to a clean energy future for heating, electricity and transport is essential for the protection of human health, the climate and the environment, and has multiple benefits for sustainable development and energy security.

- ***SOE10 Environmentally-sustainable Agriculture:*** An agriculture and food sector that demonstrates validated performance around producing food with a low environmental footprint. *Actions:* A more holistic farm management and water catchment-level management approach, encompassing all environmental pressures, will be fundamental to progress towards a more environmentally-sustainable and carbon-neutral food production system.

- ***SOE11 Water Services:*** Drinking water and wastewater infrastructure must meet the needs of our society. *Actions:* Action is needed nationally to address the underlying causes for the delays in delivering improvements in drinking water and urban wastewater infrastructure. Addressing the legacy of under-investment and fixing the shortcomings highlighted in successive EPA reports on drinking water and urban wastewater need to be prioritised. The resilience of water-related infrastructure must also improve to guard against the impacts of weather events and climate extremes on water services and the water environment.

- ***SOE12 Circular Economy:*** Move to a less wasteful and circular economy where the priority is waste prevention, reuse, repair and recycling. *Actions:* Changing our behaviours on resource consumption, waste management and recycling are actions that everybody, from business to individuals, can take to protect the environment.

- ***SOE13 Land Use:*** Promote integrated land-mapping approaches to support decision-making on sustainable land use. *Actions:* The development of an integrated national approach to land mapping could support better decision-making on land use and management practices. It could contribute significantly to mapping land use change and managing competing pressures on the environment, such as agriculture, urbanisation, tourism and recreation, energy projects, carbon sinks, ecosystem services and space for nature.

In addition, the report identified the following key challenges for the next decade:

- Halt any further deterioration in our natural environment, while supporting our economy and accommodating our growing population.
- Accelerate action to decarbonise and green our economy and society, so achieving climate neutrality by 2050.
- Protect ourselves against the inevitable consequences of climate disruption.
- Start restoring the precious habitats and water bodies that we have lost.
- Leave space for nature as part of a new approach to biodiversity protection.
- Designate more of our marine area as protected areas.
- Protect air quality by switching to cleaner fuels for energy, transport and heating homes.
- Massively reduce our annual one million tonnes of food waste.
- Foster more sustainable agricultural production and land-use systems and management.
- Invest in essential water services infrastructure that protects drinking water supplies and eliminates discharges of raw sewage.
- Achieve greater efficiency in our production and consumption activities when using raw materials.

- Secure the improvements in our natural environment that we have made through regulation and investment.
- Integrate measures to protect against radon into our built environment.
- Leverage a growing public engagement with environmental issues.
- Act on the highlights identified in 'Ireland's Environment - An Integrated Assessment 2020'. Covering thematic, sectoral and integrated areas, these highlights outline the scale of the challenges to be tackled.

3.3 Environmental Characteristics

This section describes the environmental baseline for Northern Ireland, of relevance to the draft TDPNI. The baseline has been divided by topic into the issues requiring assessment under SEA legislation. The purpose of this section is to demonstrate the level of baseline environmental information used when assessing the potential impacts of implementing the draft TDPNI. This baseline information forms the indicators which the potential projects set out in the draft TDPNI will have the potential to impact upon. Future variation in these indicators owing to implementation of the draft TDPNI will be monitored as part of the TDPNI and SEA review.

3.3.1 Biodiversity, Flora & Fauna

Biodiversity is the variety of all plants and animals, and the communities that they form. The conservation of biodiversity is important in its own right. Humans are also dependent on biodiversity for the provision of ecosystem services such as clean air and water, food and shelter, as well as for the health and amenity value that the natural environment can provide.

The importance of preserving biodiversity has increasingly been recognised from an international to a local level, and Northern Ireland has legal obligations under International and EU commitments and legislation. The UN Convention on Biological Diversity (1992) is an international legally binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; and the fair and equitable sharing of the benefits arising from the use of genetic resources. It requires the development of national strategies for the conservation and sustainable use of biological diversity. The most recent Biodiversity Strategy for Northern Ireland, "Valuing Nature", was published by DAERA in 2015 and covered the period up to 2020. This set out how Northern Ireland planned to meet its international obligations and local targets to protect biodiversity, and to ensure that the environment can continue to support the population and economy of Northern Ireland. Its overall mission was "To make progress towards halting overall biodiversity loss, establish an ecosystem approach and help business and society in general have a greater understanding of the benefits that nature can bring to everyday life in Northern Ireland". Following the UN Biodiversity Conference in December 2022 (COP15), a Global Biodiversity Framework (GBF) was agreed that aims to see 30% of land protected globally by 2030. A new Biodiversity Strategy for Northern Ireland is currently in production, that will reflect the targets set out by the GBF.

The draft TDPNI must also have regard for the Habitats Directive and the Birds Directive, as transposed through the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, which require that any plan or project not directly connected with or necessary to the management of a European site but likely to have a significant effect on such a site, must undergo an appropriate assessment in view of best scientific knowledge and in view of the conservation objectives of the site. The draft TDPNI falls under this remit, and an Appropriate Assessment is being undertaken in parallel to the SEA process, to assess the potential implications of the Plan for European Sites.

It is considered that the key issues associated with implementation of the draft TDPNI and Biodiversity, Flora and Fauna comprise:

- Potential for effects on protected areas, including those of international (SACs, SPAs, Ramsar Sites), National (ASSIs, MCZs, NHAs / pNHAs, NNRs) and local (SLNCI) importance.
- Potential for effects on protected Annex I habitats or Annex II species outside of designated sites and on Northern Ireland priority habitats and species.
- Potential for effects on fauna, including construction-phase disturbance or longer-term effects.
- Potential for effects on habitats sensitive to construction (e.g., peatlands).
- Potential for effects on water-dependent habitats and species (including effects on freshwater pearl mussel, salmonids, and other protected fish and shellfish species).
- Potential for habitat loss, fragmentation, or deterioration (temporary or permanent).
- Potential for introduction of invasive, non-native species during construction.

3.3.1.1 Designated Sites

3.3.1.1.1 Overview of Designated Sites

There are a wide variety of natural habitats and species within Northern Ireland. The Northern Ireland Environment Agency (NIEA) has compiled a list of those habitats and species considered to be priority, based on their listing as a UK Priority Habitat[14] / Species[15] or importance in an all-Ireland context, and current downward trends; the most recent lists comprise 51 Northern Ireland Priority Habitats, and 594 species. Priority Habitats include coastal saltmarsh, hedgerows, lowland raised bog and rivers, while Priority Species include River and Sea Lamprey, Small and Large Heath butterflies, Shoveler and Wigeon and several Saxifrage species.

Sites have been designated to provide protection to those habitats and species considered to be of particular conservation value. These include features whose conservation is of importance at a European level, for which 58 Special Areas of Conservation (SACs), 16 Special Protection Areas (SPAs), and 20 Ramsar Sites have been designated, to date. Northern Ireland has 49 habitats listed in Annex I of the Habitats Directive, of which 13 are priority habitats at a European level, and 18 species listed in Annex II of the Directive[16].

At a national level, 394 Areas of Special Scientific Interest (ASSIs) and 50 statutory Nature Reserves have been designated to provide protection to features considered to be of national importance, while 940 sites have been designated for their importance at a more local level. These designated sites in Northern Ireland are detailed in **Table 3-3** and their locations shown in **Figure 3-1**. In addition, there are 10 sites in Northern Ireland protected as RSPB nature reserves, and 18 sites protected as Ulster Wildlife nature reserves. There is over 110km^2 of ancient woodland (land continuously wooded since at least 1600) within Northern Ireland. There are also five Marine Conservation Zones (MCZs) designated under the Marine Act (Northern Ireland) 2013 to safeguard vulnerable or unique marine species and habitats of national importance in the inshore region of Northern Ireland.

Sites have also been designated for nature conservation within the Republic of Ireland. Some sites within the Republic of Ireland extend into Northern Ireland, and others are in close proximity; there may therefore be potential for transboundary effects on these sites from implementation of the draft TDPNI. There are 30 SACs, 12 SPAs, 13 Natural Heritage Areas (NHAs) and 100 proposed Natural Heritage Areas (pNHAs) in the Republic of Ireland within 15km of the boundary with Northern Ireland, as shown in **Figure 3-1**.

[14] https://www.daera-ni.gov.uk/publications/northern-ireland-list-priority-habitats

[15] https://www.daera-ni.gov.uk/publications/list-northern-ireland-priority-species-2023

[16] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/natural-information-ni-habitats-and-species-2013.pdf

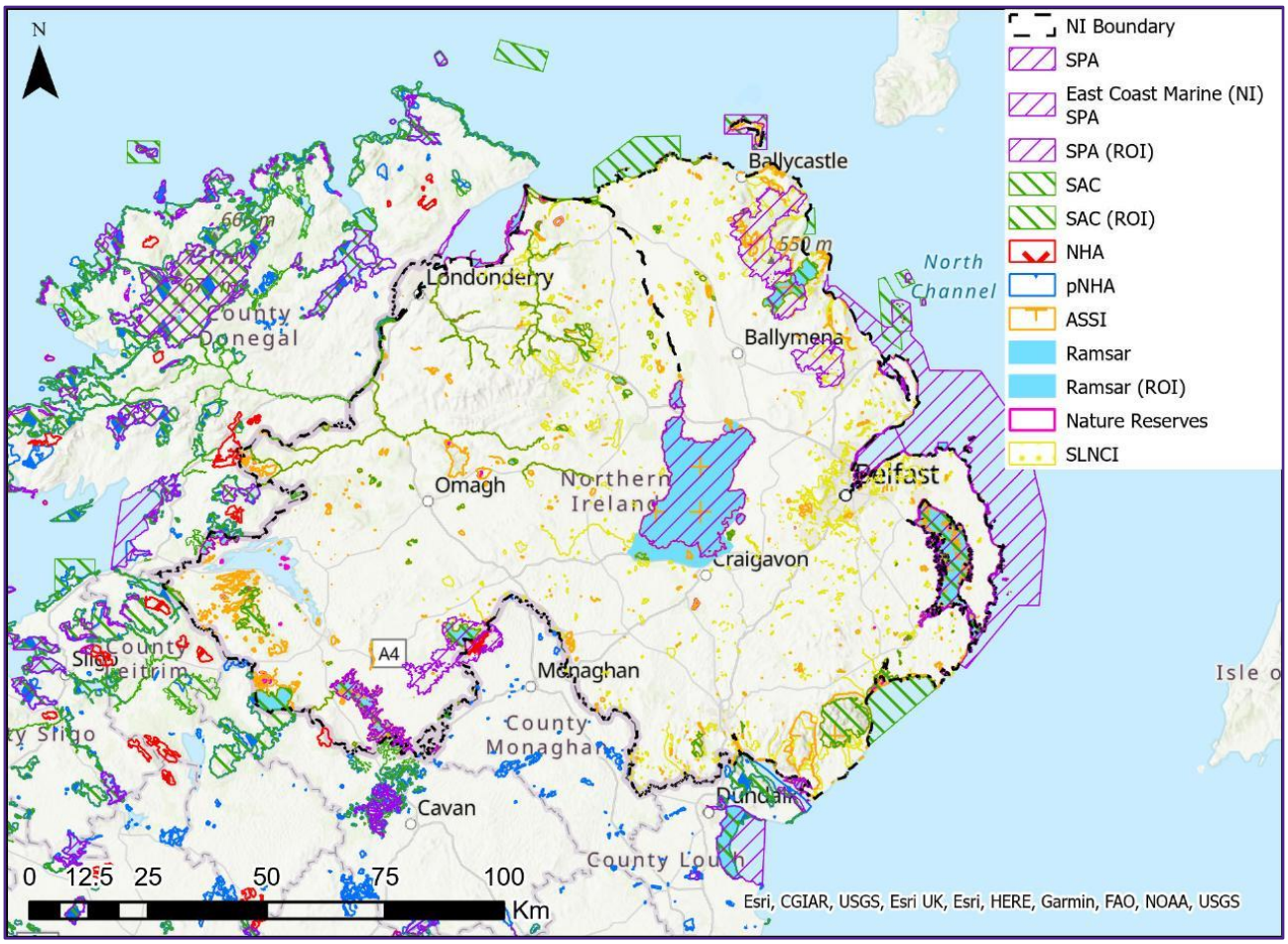


Figure 3-1 Designated sites across Northern Ireland and the border regions with the Republic of Ireland

Table 3-3 Number and type of sites designated for conservation of Biodiversity, Flora and Fauna in Northern Ireland

Site Designation	Description	Number
Special Areas of Conservation (SACs)	Existing SACs in Northern Ireland were designated in accordance with the Habitats Directive (92/43/EEC) for the conservation of certain habitats and species while SPAs were designated under the EU Directive on the Conservation of Wild Birds (EC/79/409), "The Birds Directive", as areas that are important for breeding, feeding, wintering or migration of rare and vulnerable bird species. Together these formed part of the Natura 2000 network of protected sites. Following the UK's exit from the EU, there is now a UK National Site Network of European sites, comprising existing designated sites and any further sites designated under the Habitats Regulations. SACs and SPAs in the Republic of Ireland remain part of the Natura 2000 site network.	58
Special Protection Areas (SPAs)		16
Ramsar Sites	Ramsar sites are designated under the "Ramsar Convention" (Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, Iran 1971), an international treaty for the conservation and sustainable use of wetlands.	20

Areas of Special Scientific Interest (ASSIs)	Areas of Special Scientific Interest (ASSI) are protected under the Environment (Northern Ireland) Order 2002. This requires NIEA to designate land as an ASSI that it considers to be of special scientific interest, owing to the flora or fauna present, or the presence of geological features	394
National Nature Reserves	Statutory Nature Reserves are areas of importance for flora, fauna, geological or other special features for conservation purposes and to provide the opportunity for research. They are designated under the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985.	50
Sites of Local Nature Conservation Importance (SLNCIs)	Each council area in Northern Ireland reports on locally important sensitive or valued habitats through the production of Local Biodiversity Action Plans (LBAPs). These Plans outline the areas of importance for natural heritage reasons within the council area, guiding development policy and potential enhancement of local biodiversity. These are known as SLNCIs.	940
Marine Conservation Zones (MCZs)	Marine Conservation Zones (MCZs) protect nationally important marine species, habitats and features of geological or geomorphological interest. Priority Marine Features (PMF) is a collective term for the features considered to be of conservation importance in the Northern Ireland inshore region and form the basis of MCZ designation under the Marine Act (NI) 2013.	5

3.3.1.1.2 Status and Trends for Sites important at an International Level (SACs and SPAs)

Article 17 of the Habitats Directive requires that, every six years, all EU Member States report on the implementation of the Directive, including on the conservation status of habitats and species (informally known as the Article 17 report). The 4th UK Habitats Directive Report was submitted to the European Commission in August 2019, and included a General Implementation Report, Habitat Reports and Species Reports. These outlined any changes in designated habitats and species, for the UK as a whole, in the period 2013-2018[17]. Only six habitats were given an overall conservation status of 'Favourable', with eight habitats classified as 'Inadequate', 62 as 'Bad' and one classified as 'Unknown' conservation status. Of these, 22 habitats showed improvement in overall conservation status, 29 habitats showed no change, 22 habitats showed a decline, and 4 were uncertain in comparison with the results of the 3rd UK Habitats Directive Report. Of the designated species reported, 33 were given an overall conservation status of 'Favourable', 24 a status of 'Inadequate', 16 a status of 'Bad' and 20 a status of 'Unknown'. Of these, 9 species showed improvement in overall conservation status, 47 showed no change, 12 showed decline and 25 were uncertain in comparison with the results of the 3rd UK Habitats Directive Report.

Article 12 of the Birds Directive requires that, every six years, all EU Member States report on the implementation of the Directive. The 11th UK Report for Article 12 of the EU Birds Directive was submitted to the European Commission in October 2019. The report format includes both a General Report on the implementation of the Directive (Annex A), and a Bird Species Status and Trends Report containing individual assessments for all relevant bird species (Annex B). Of the 319 birds included in this assessment (including in some cases both breeding and wintering populations separately), 131 showed a short-term decreasing population trend, while 108 showed a long-term decreasing population trend.

Following the UK's exit from the EU, reporting to the European Commission will no longer be required, however DAERA will report periodically every 6 years following exit from the EU. The first of these reports is due in 2026.

[17] https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-habitats/

3.3.1.1.3 Status and Trends for Sites important at a National Level (ASSIs)

Northern Ireland launched its first State of the Environment Report in 2008, containing 30 indicators that were designed to assist future comparison and measurement of the changing environment. The last full State of the Environment Report for Northern Ireland was published in 2013 and, in the interim period, the NIEA has published annually a Northern Ireland Environmental Statistics Report, providing annual reports on a range of environmental indicators. The most recent report is for 2023[18], and Section 5 provides key information regarding the current status of biodiversity indicators in Northern Ireland.

For the first time in 2022, and continued in 2023, a combined feature condition standard for all network features on land and sea in Northern Ireland was produced. This is a new metric collated for the country which helps align with UK reporting.

The 2023 report indicated that:

- 55% of all features were in a Favourable condition.
- 36% of all features were in an Unfavourable condition.
- 3% of all features were in an Unfavourable Recovering condition.
- Less than 1% of all features were destroyed.
- 6% of all features had an undetermined condition due to a lack of formal assessment.

When this is partitioned into the biological and earth science features assessed, 38% of habitats and 57% of species features were in Favourable condition, compared to 94% of earth science features in Favourable condition, reflecting the greater pressures on the natural environment.

These results remain very similar to the previous 10 years of reporting. NIEA is aiming to achieve favourable condition for a much higher proportion of the ASSI network, and there is now a focus on improving the overall condition of sites towards “favourable conservation status (FCS)” through effective land management to support recovery of the special features within the site. The Environmental Statistics Report 2023 states that, in 2022/2023, the area of terrestrial protected sites under management in NI was recorded as at least 358.96 km^2, a significant increase since the baseline year for reporting (2015/2016) when just 2.63 km^2 of terrestrial sites were under favourable management.

The area of marine protected sites under management in 2022/23 was recorded as 211.68 km^2, which has increased since the baseline year for PfG reporting (2015/16) when 83.62 km^2 of marine protected sites were under favourable management. The focus between 2018 and 2023 is on bringing the protected area network into favourable management, through identification and introduction of necessary management measures for marine protected areas.

3.3.1.2 Habitats and Species Sensitive to Construction

Certain habitats and species have a higher sensitivity to disturbance; this includes the potential for impacts from the construction, maintenance or decommissioning of transmission infrastructure. These impacts may include habitat degradation, fragmentation, or loss, disturbance or displacement, or the introduction of invasive non-native species.

3.3.1.2.1 Water-Dependent Habitats and Species

The construction, operation, maintenance and decommissioning of transmission infrastructure can impact on the aquatic environment. An evidence-based study[19] has been completed to determine the impact of transmission development on water quality and aquatic ecology, in the Republic of Ireland. This study indicated that sediment release is the most significant risk to water quality and aquatic ecology from transmission infrastructure projects. This can occur when land is being cleared for construction, through erosion and run-

[18] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ni-environmental-statistics-report-2023.pdf

[19] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 6: Water Quality and Aquatic Ecology. Literature and evidence based field studies on the effects of high voltage transmission lines on water quality and aquatic ecology in Ireland.

off. Pollutants can also come from concrete and hydrocarbons, which are used in the foundations for towers and for culverts. These pollutants can lead to an increase in the sediment load and a lowering of the pH of surface water bodies, with implications for sensitive species including freshwater pearl mussel and species of aquatic plants. Impacts particularly result from construction works near to watercourses that have limited to no buffer zones, from site clearance, from damage or alteration to riverbanks / riparian zones and from site flooding.

The Water Framework Directive (WFD) (200/60/EC), transposed in Northern Ireland through The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017, required Member States to develop a Register of Protected Areas comprising lands that have been designated as requiring special protection under specific Community legislation for protection of surface water or groundwater, or for conservation of habitats and/or species that depend upon water. These components, which had to be established for each River Basin District (RBD), are outlined in Annex IV of the WFD, and include sites that are used for water abstraction, those designated for salmonids, those designated for bathing, those designated for shellfish production, nutrient sensitive areas, and those designated "for the conservation of habitats and species directly depending on water". The Water (Amendment) (Northern Ireland) (EU Exit) Regulations 2019 ensured that the WFD (as transposed) and the various supporting pieces of water legislation continued to operate in Northern Ireland after 1 January 2021. Where a European site (SAC or SPA) lies within a water body, the WFD status objectives apply in addition to the requirement to maintain the site at favourable conservation status or restore it to that status.

Table 3-4 details the surface water-dependent European sites within the North Eastern, North Western and Neagh Bann RBDs. For the draft 3rd cycle RBMP 2021-2027[20], a total of 27 water-dependent European sites were identified for the North Western RBD. Of these, 81% are currently in unfavourable condition, and for 30% of sites this is due, at least in part, to pressures from the water environment. In the Neagh Bann RBD there were 24 water-dependent European sites; of these 75% are currently in unfavourable condition, and for 25% this relates to water pressures. A total of 25 water-dependent European sites were identified for the North Eastern RBD, of which 56% are currently in unfavourable condition, with 12% of sites due to water pressures. For Northern Ireland as a whole, 71% of water-dependent European sites are currently in unfavourable conservation condition (i.e., failing to meet their conservation objectives), with these failures relating to pressures from the water environment in 23% of sites.

Table 3-4 Surface water-dependent European Sites in unfavourable condition owing to pressures from the water environment*

	NWRBD		NBRBD		NERBD		Northern Ireland	
	No.	%	No.	%	No.	%	No.	%
Number of sites	27	100	24	100	25	100	66**	100
Number of sites in unfavourable condition	22	81	18	75	14	56	47	71
Number of sites in unfavourable condition due to pressures from the water environment	8	30	6	25	3	12	15	23

[20] https://www.daera-ni.gov.uk/sites/default/files/consultations/daera/Draft%203rd%20cycle%20River%20Basin%20Management%20Plan%20for%20Northern%20Ireland%202021-2027_0.PDF

*(Reproduced from Table 29, Draft 3rd Cycle RBMP)

**Note: some protected sites straddle more than one RBD, hence the NI total does not equal the sum of the RBDs.

The freshwater pearl mussel, *Margaritifera margaritifera*, is a large bivalve mollusc that lives in the bed of rivers and streams. It is highly sensitive to changes in water quality, particularly concerning nutrient pollution and sediment loading. In Northern Ireland, the species formerly occurred widely in several catchments, with past records existing for 11 rivers from which no recent records have been obtained. Freshwater pearl mussel populations are now only found in 6 rivers in Northern Ireland (**Figure 3-2**), the Owenkillew River, Cladagh / Swanlibar River, upper Ballinderry River, Owenreagh River and Tempo River. The Owenkillew, Cladagh / Swanlibar and Upper Ballinderry Rivers are designated as SACs, while the Owenreagh and Tempo Rivers are designated as ASSIs. A Species Action Plan for freshwater pearl mussel in Northern Ireland was published in 2005[21], which outlined the status of populations at that time, factors contributing to loss or decline of the species, and both current and proposed actions to protect the species. This indicated that the species had undergone a large decline in absolute numbers and range but, in at least three rivers, over one million individuals remained. However, populations were characterised by an ageing cohort, with little or no recent recruitment. Article 17 reporting for the UK as a whole, in the period 2013-2018 indicates that freshwater pearl mussel is currently at 'Unfavourable-Bad' conservation status[22]. Northern Ireland's supporting documentation for the conservation status assessment of the species[23] states that the area and quality of occupied / unoccupied habitat is not sufficient to maintain the species at Favourable Conservation Status, and that the lack of juvenile recruitment and an ageing population is expected to lead to the future extinction of the species from Northern Ireland, unless a significant improvement of their habitat conditions occurs. Owing to the sensitivity of the species, pressures and threats relating to water quality are of great importance.

Shellfish water protected areas (**Figure 3-2**) are areas designated for the protection of shellfish growth and production. Good water quality within these areas is important for the production of high-quality shellfish. Both the Shellfish Directive (79/923/EEC) and Freshwater Fish Directive (78/659/EEC) were revoked in 2013 and subsumed into the WFD. Areas previously designated under these Directives are now areas designated for the protection of economically significant aquatic species under the WFD and listed on the Protected Areas register.

Within the North Eastern RBD, 662km of rivers, 5.5km^2 of canals and 2km^2 of lakes are designated for fish[24], while in the North Western RBD there are 1681km of rivers and 149km^2 of lakes designated[25] and in the Neagh Bann RBD there are 1936km of rivers, 43km of canals and 292km^2 of lakes designated[26]. In Northern Ireland as a whole, 20 lakes and 413 rivers have been designated as salmonid waters (**Figure 3-2**). In addition to designated species, fish species in general can be significantly affected by changes in water quality and sedimentation, particularly in spawning and nursery areas, as well as by changes in the hydrology of surface water bodies, including those that may affect the passage of migratory species.

[21] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Natural-plan-species-action-freshwater-pearl-mussel.pdf

[22] https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-habitats/

[23] https://jncc.gov.uk/jncc-assets/Art17/S1029-NI-Habitats-Directive-Art17-2019.pdf

[24] https://www.daera-ni.gov.uk/publications/north-eastern-river-basin-management-plan-2015-2021

[25] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/water-report-north-western-river-basin-plan-2015.pdf

[26] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/water-report-neagh-bann-river-basin-plan-2015.pdf

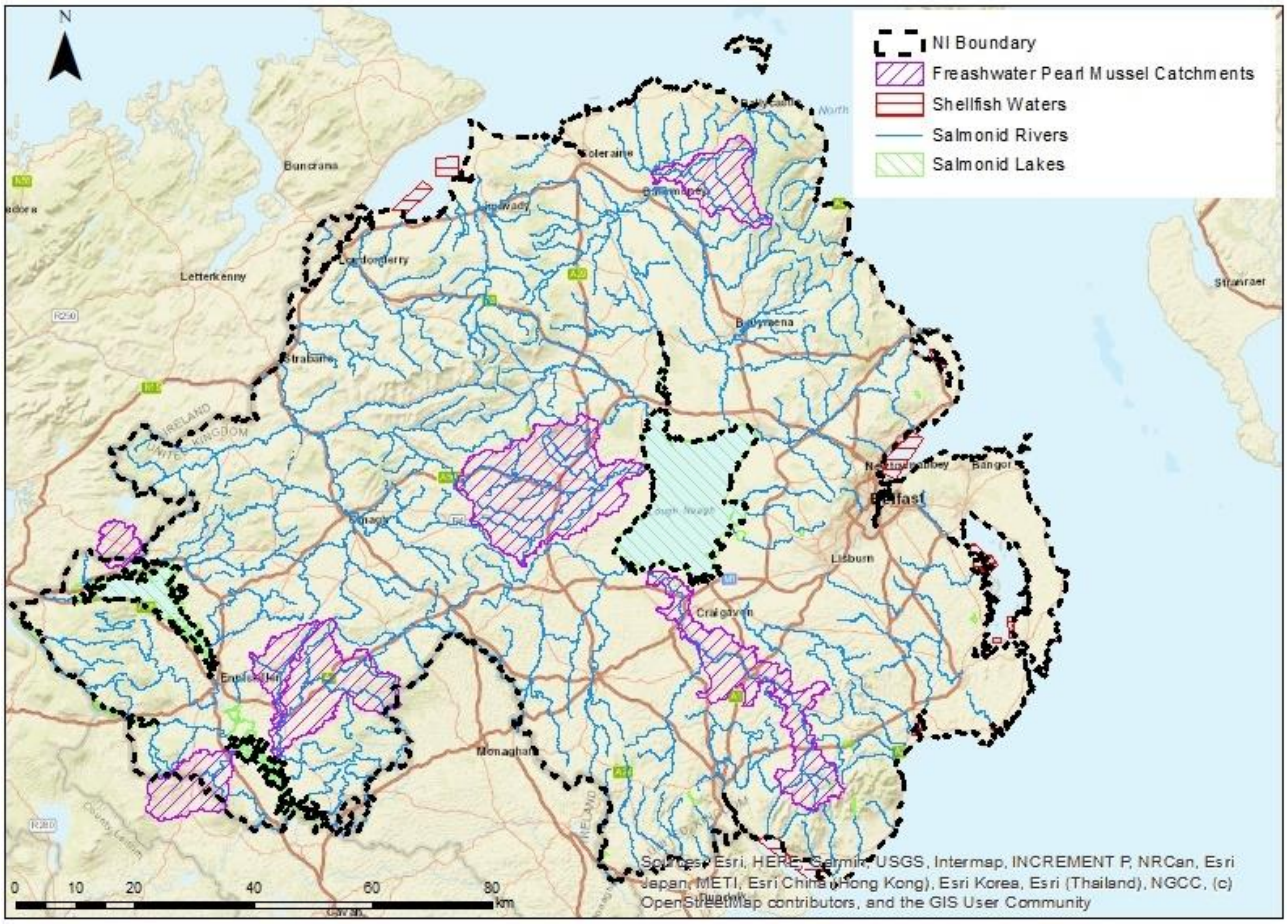


Figure 3-2 Designated Freshwater Pearl Mussel sites, Shellfish Waters and Salmonid waters across Northern Ireland

3.3.1.2.2 Terrestrial Habitats and Species

Evidence-based studies[27] have been completed to determine the impact of transmission development on natural and semi-natural habitats, and on risks to birds[28] and bats[29], in the Republic of Ireland.

The construction, maintenance and decommissioning of electricity transmission infrastructure can potentially damage habitats. Habitats of particular conservation importance include those that are protected as Annex I habitats under European law (Habitats Directive and implementing Habitats Regulations (NI)), including active peatlands and hay meadows. A comprehensive review of literature for the evidence-based study of effects of transmission development on natural and semi-natural habitats found that linear construction projects can affect habitats in several ways, including through habitat loss, habitat change, fragmentation and hydrological change. Some habitats are more sensitive to disturbance and therefore the potential impacts of the construction and maintenance of transmission infrastructure. Peatlands were found to be the most sensitive to construction work, while grassland habitats were found to recover rapidly following the completion of construction activity. Further information regarding the potential for effects on land use types sensitive to

[27] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 4: Habitats. Literature and evidence based field studies on the effects of high voltage transmission lines on natural and semi-natural habitats in Ireland.

[28] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 5: Birds. Literature and evidence based field studies on the effects of high voltage transmission lines on birds.

[29] RPS Group 2015. EirGrid Evidence Based Environmental Studies Study 3: Bats. Literature and evidence based field studies on the effects of high voltage transmission lines on bats in Ireland.

construction and operation of electricity transmission infrastructure, such as peatlands is provided in **Section 3.3.3** of this report.

There are eight species of bat known to commonly occur in Northern Ireland (of the nine species found in Ireland); these are Common pipistrelle, Soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, Brown long-eared bat, Whiskered bat, Natterer's bat and Daubenton's bat. These are all strictly protected under the Habitats Regulations (NI) 1995 (as amended) and are known as European protected species. Their protection includes deliberate capture, injury killing and disturbance, as well as protection of their breeding and resting places (roosts). Habitats of importance to bats include woodlands, hedgerows, ponds, caves and stone buildings. The evidence-based study of effects of transmission development on bats included a comprehensive literature review on the potential impacts of these developments on bats, including the risk of collision and electrocution, and the risk from electromagnetic fields (EMFs), as well as a field study to determine the effects of existing infrastructure on bat activity. This found there to be little evidence of potential for direct impacts of electricity transmission infrastructure on bats, however indirect effects were found from habitat alteration to hedgerows and trees of importance for feeding and navigation (through construction phase impacts). In terms of the potential for effects on electricity transmission lines during operation, power lines were found not to have a deterrent effect on the more common resident Irish bats while in flight.

The potential for adverse effects of electricity transmission infrastructure on birds relates primarily to the potential for temporary or permanent disturbance, loss or fragmentation of habitat during the construction phase, that may affect roosting or nesting sites, or habitats used for foraging. The operation of this infrastructure can also pose a risk to birds through collision with power lines, electrocution of perching birds, and displacement or loss of habitat quality in areas used for breeding or overwintering[30]. The Wildlife (Northern Ireland) Order 1985 (as amended) is the main piece of legislation that protects all wild birds in Northern Ireland. It is illegal to intentionally or recklessly take, injure or kill any wild bird, or to take, damage or destroy an active nest or its contents. The evidence-based study of effects of transmission development on birds[25] included a comprehensive literature review. This found that large species such as swans, geese and cranes are most at risk of collision with transmission lines, and that bird species considered to be poor fliers, such as grouse, pheasants and rails are also vulnerable to collision. The main cause of bird collisions is due to the thin wire present at the top of powerlines. The associated field study of bird mortality and flight activity in relation to high voltage transmission lines at sites in Ireland found that the highest risk sites were adjacent to wetland areas, and that a lower density of birds was found within a maximum distance of 100m from powerlines.

3.3.1.3 Invasive Non-Native Species

Non-native species comprise those species that have been introduced outside of their natural range, intentionally or unintentionally. Some of these species are known as 'invasive non-native species' (INNS), as they thrive within their introduced environment, and can out-compete native species of flora and fauna. INNS can pose a significant threat to native biodiversity. Removal of habitat, such as for a road or other utility corridors, can encourage the spread of INNS through direct introduction of non-native species by the transfer of vector material present on vehicles or other equipment used in construction, or through the creation of edge effects.

The Invasive Alien Species (Enforcement and Permitting) Order (Northern Ireland) 2019 makes it an offence to cause the spread of certain species of plants and animals that are on the EU List of Union Concern. The Wildlife (Northern Ireland) Order 1985 (as amended) also continues to provide regulation of other INNS. Management measures have been established for those species of plants and animals on the Species of Union Concern list that are considered to be established and widely spread within Northern Ireland. These include eight species of plants, including Giant hogweed and Himalayan balsam, and three species of animal, including New Zealand flatworm, Grey squirrel and Slider terrapin[31].

[30] file://belf-eh-fs-02/40/Section%2040/Environmental%20Information/Energy/Guidelines/EirGrid-Ecology-Guidelines-for-Electricity-Transmission-Projects.pdf

[31] https://www.daera-ni.gov.uk/articles/widely-spread-species-management-measures

3.3.1.4 Summary of Existing Pressures and Issues for Biodiversity, Flora and Fauna in Northern Ireland

Despite an increase in actions to halt biodiversity loss, many elements of biodiversity in Northern Ireland are continuing to show declines[32]. Impacts of human activities, particularly land use change associated with agriculture and development, pollution and fisheries (particularly in the marine environment), are key pressures affecting biodiversity in Northern Ireland. Invasive non-native species are also a significant threat to native biodiversity. Development such as housing and infrastructure associated with population growth has contributed to a loss of terrestrial and freshwater habitats, with over 40,000 hectares of countryside lost through urban development since the 1950s.

Priority habitats, and particularly grassland habitats, in Northern Ireland have shown an overall decline since 2000, while a significant number of priority species such as breeding waders are also showing declines[14]. The latest UK Article 17 reporting for habitats and species protected at a European level found that only 6% of habitats and 35% of species are currently in a favourable conservation condition, and that 22 habitats and 12 species showed a decline in condition since the previous reporting period. Monitoring of features within nationally protected sites has shown that just 38% of habitats and 56% of species features are in a favourable condition.

Any linear construction project, such as the construction of transmission infrastructure, has the potential for direct and indirect impacts on biodiversity, including on international, national and local designated sites, habitats or species alone, or in combination with, these existing pressures. Such impacts include habitat loss, damage or fragmentation as well as changes in hydrological conditions for wetland habitats, hazards to birds through collision and / or electrocution, construction disturbance to mammals, and loss of species. Introduction of additional people to rural and natural areas during the construction, maintenance or decommissioning of transmission infrastructure has the potential to increase disturbance to local habitats and species, and to encourage the spread of invasive non-native species. The construction and operation of such infrastructure can increase the risk of fire within the vicinity of the transmission corridor. There is potential to avoid or minimise impacts on biodiversity, flora and fauna by following best practice measures during route planning and construction, including consideration of Eirgrid's Ecology Guidelines for Electricity Transmission Projects (2020) and the IUCN guidelines for preventing and mitigating wildlife mortality associated with electricity distribution networks (2022)[33].

3.3.2 Population & Human Health

Population and human health considers the presence and wellbeing of people, and their activities and use of receiving environments. Population size, growth predictions and distribution within an area can indicate both the potential pressures that people may exert on resources and infrastructure, and the potential to which they may be exposed to pollution, disturbance, or other risks. Health of a population can be adversely affected through several direct and indirect pathways, including through emissions to water and air, health and safety risks, noise and other disturbance.

[32] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

[33] https://portals.iucn.org/library/node/50657

It is considered that the key issues associated with implementation of the draft TDPNI and Population and Human Health comprise:

- Potential for disturbance of the local population during construction (e.g., dust, noise).
- Potential for disturbance of the local population during operation (e.g., noise).
- Potential for health and safety impacts on the local population.
- Interaction between transmission infrastructure and settlement patterns.
- Potential / perception of Electromagnetic Field (EMF) risk from electricity transmission lines
- Potential for cumulative effects on local populations, including in deprived or sensitive areas.
- Potential effects on air quality (reduced emissions).

3.3.2.1 Population Demographics for Northern Ireland

The total population of Northern Ireland in 2021 was approximately 1.903 million people[34], and is predicted to increase to approximately 1.99 million individuals by 2043[35]. Population growth has been positive for the past 25 years, and over the decade from mid-2010 to mid-2020 increased at an annual growth rate of 0.5%. The period from mid-2019 to mid-2020 showed the lowest level of population growth in over 20 years, at 0.1%, influenced by the Covid-19 pandemic and the EU Exit, and their effects on the death rate and net migration[36].

The population density of Northern Ireland in 2021 was 135 people per km^2, varying across the Local Government Districts, and with a more dispersed population in rural areas. The current population by km^2 by census small areas is shown in **Figure 3-3**. Rural populations in Northern Ireland are defined by their distance to Belfast, as the largest urban centre, as this tends to govern the type of rural land use that occurs as well as access to urban employment and to various services. The population of Northern Ireland estimated to be living in urban and rural areas in 2019 is shown in **Table 3-5**.

Table 3-5 Northern Ireland population in Urban and Rural Areas, 2019

Urban / Rural	No.	%
Urban	1,128,725	60%
Rural <= 60 mins from Belfast	432,334	23%
Rural > 60 mins from Belfast	244,687	13%
Mixed urban / rural	87,945	5%

Over two-thirds of all residents in Northern Ireland aged 16 to 64 years were economically active in the 2021 census (70.2%); these were primarily composed of full-time and part-time employees. In 2021, most district council areas in Northern Ireland saw an increase in employee jobs[37].

It is best practice in route planning to seek to avoid, whenever possible, heavily populated areas on the grounds of general amenity, to minimise the number of people affected and to reduce the potential for adverse effects

[34] https://www.nisra.gov.uk/system/files/statistics/census-2021-main-statistics-for-northern-ireland-phase-1-report.pdf

[35] https://www.nisra.gov.uk/statistics/births-deaths-and-marriages/registrar-general-annual-report

[36] https://www.nisra.gov.uk/publications/long-term-international-migration-statistics-northern-ireland-2020

[37] https://www.nisra.gov.uk/statistics/annual-employee-jobs-surveys/business-register-and-employment-survey

of overhead line transmission development projects[38]. An evidence-based study has been completed to determine the effects of high voltage transmission development (including overhead lines, underground cables and substations) on patterns of settlement and land use in the Republic of Ireland[39]. A review of literature found that impacts on land use and settlement were rarely significant and tended to be local, i.e., within the vicinity of towers and circuits, while issues are more likely to arise owing to possible restrictions on future land uses, particularly in built-up areas. An investigation into transmission projects and levels of coexistence found there to be low levels of coexistence (coexistence of buildings along transmission infrastructure) found in rural areas, but significant coexistence found in urban and urban / rural areas in Ireland. A study of four transmission construction sites to identify any impacts of these projects on patterns of settlement and land use found that, following the announcement of the projects, there continued to be applications for planning permission within their vicinity. This indicated that other factors were of overriding importance. No evidence was found of any significant impact arising from the construction or existence of transmission infrastructure in terms of patterns of settlement and land use; however, it was found that transmission infrastructure could pose a local physical constraint on development. The existing electricity transmission network is shown alongside the current population densities across Northern Ireland in **Figure 3-3**.

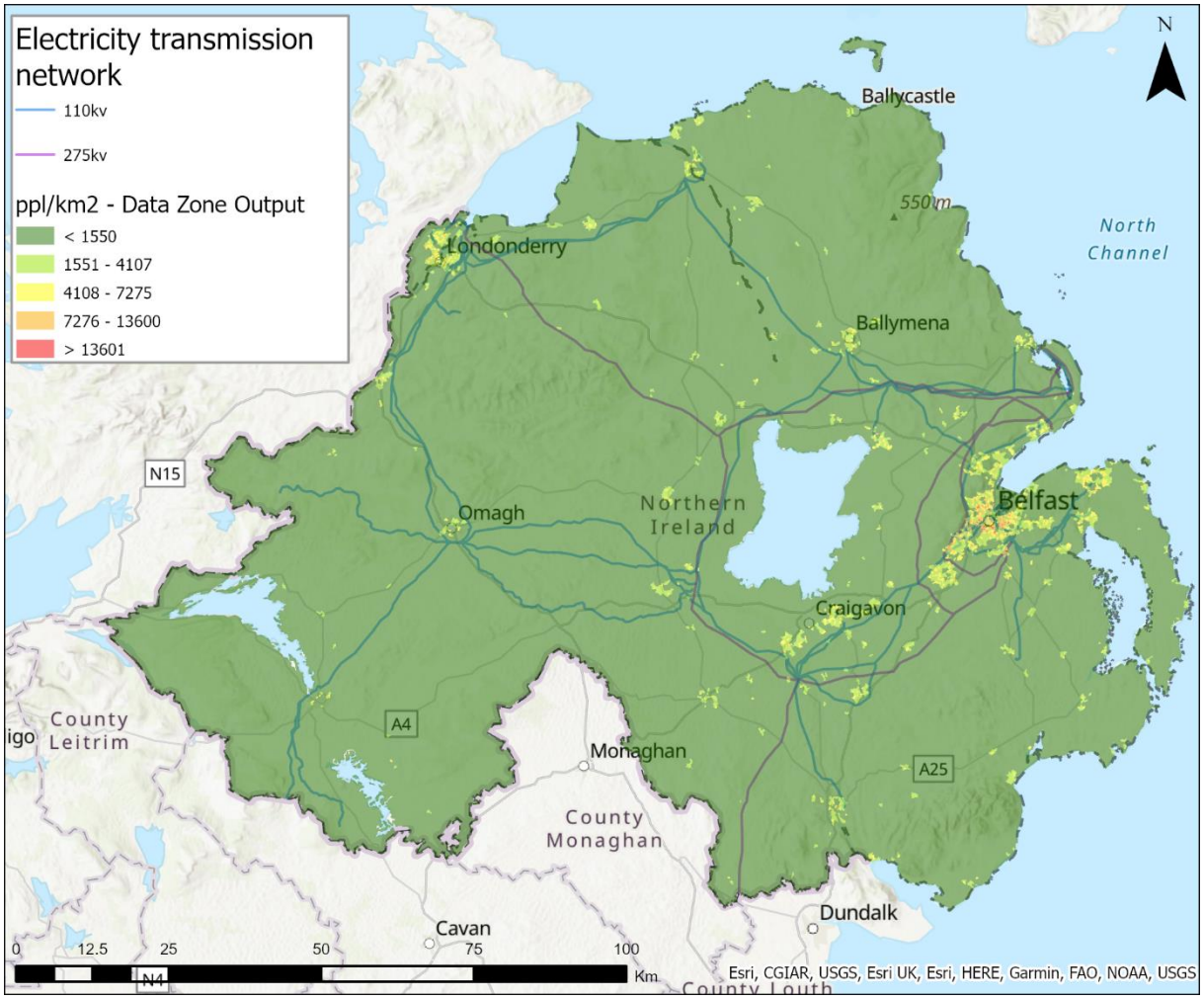


Figure 3-3 Population per km^2 by Census Small Areas and existing electricity transmission network

[38] https://www.nationalgrid.com/sites/default/files/documents/Development%20near%20overhead%20lines_0.pdf

[39] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 9: Settlement and land use. Literature review and evidence based field study on the effects of high voltage transmission development on patterns of settlement and land use.

3.3.2.2 Population Health

In 2019-2021, life expectancy at birth was 78.4 years for men and 82.2 for women living in Northern Ireland[40], an increase from 69 and 76, respectively, since the base reporting period of 1980-1982. Northern Ireland has an ageing population, with 17.2% aged over 65 years, and it is projected that the over 65-year population will be larger than the number of children (0-15 years) from mid-2028 onwards[41]. The primary causes of death for people in Northern Ireland in 2021 were cancer (26.1%, most commonly bronchus or lung) and circulatory (21.1%), followed by Covid-19 (10.5%), respiratory (8.8%), other causes (17.5%) and Alzheimer's / dementias (10.7%)[42].

In the NI census in 2021, just under four-fifths (78.7%) of Northern Ireland residents reported themselves to be of good or very good general health. Over one in five of the resident population (24.3%) had a long-term health problem or disability, which limited their day-to-day activities. The most common long-term conditions among the resident population were long-term pain or discomfort (11.6%) and a mobility or dexterity problem (10.9%)[43].

Electric and magnetic fields are produced when electric current flows; electromagnetic fields (EMFs) from electricity are in the extremely low frequency end of the electro-magnetic spectrum. As these occur wherever electricity is generated, transmitted or used, people are regularly exposed to them from sources other than electricity lines, including at home and in places of work. Although there can be concern from the public about EMF and health, extremely low frequency EMFs have been researched and monitored and the consensus from health and regulatory authorities is that they do not pose a health risk[44]. An evidence-based study[45] has been completed that measured the EMF generated by single and double circuit overhead 110 kV, 220 kV and 400 kV lines, transformer substations, and underground cables at 110 kV and 220 kV, in the Republic of Ireland. Results were compared to health protection guidelines for public exposure to EMF developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). From this study it was found that the maximum magnetic field strength, measured at all lines and substation perimeters, was well below the ICNIRP public exposure reference level, set to protect public health. Within Northern Ireland there are no transmission lines being proposed by the TDPNI above 275 kV. Therefore, there is unlikely to be any risk to public health from EMF resulting from the proposed TDPNI projects, and EMF is not considered further in the assessment of potential impacts on population and human health.

Construction activities associated with the development of the transmission infrastructure may lead to short-term disturbances to the local communities, including through noise disturbance. An evidence-based study[46] has been completed to determine the noise effects of the construction and presence of high voltage transmission infrastructure, including overhead lines and substations, in the Republic of Ireland. Noise may be generated from electricity infrastructure in several ways, which fall within four main categories:

- Audible noise, associated with "Corona Noise" from high voltage transmission lines – generally heard as crackling and hissing.
- Audible noise associated with dirty, damaged or cracked insulators.
- Audible noise associated substation equipment.
- Audible noise associated with wind blowing through electricity infrastructure (Aeolian Noise).

[40] https://www.health-ni.gov.uk/sites/default/files/publications/health/hscims-life-expectancy-ni-2019-21.pdf

[41] https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/MYE20-Bulletin.pdf

[42] https://www.nisra.gov.uk/system/files/statistics/RG%20Annual%20Report%202021.pdf

[43] https://www.nisra.gov.uk/system/files/statistics/census-2021-main-statistics-for-northern-ireland-phase-2-report.pdf

[44] https://www.soni.ltd.uk/media/SONI_Power_Lines_and_your_Health.pdf

[45] RPS Group 2014. EirGrid Evidence Based Environmental Studies Study 1: EMF. Literature review of electromagnetic fields (EMF) and human health, and an evidence base of EMF measurements from the Irish Transmission System.

[46] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 8: Noise. Literature review and evidence based field study on the noise effects of high voltage transmission development.

A review of the literature for the evidence-based study of noise effects indicated that the level of noise impact likely from electricity transmission lines increases with the increase of the voltage strength of the line, and that "Corona Noise" only becomes a significant issue for 350-500 kilovolts (kV) and above. This would suggest that significant "Corona Noise" impacts may not be likely for 110 kV and 220 kV transmission lines and that the potential for more significant impacts may only relate to 400 kV lines. This was substantiated by field surveys, which found that 110 kV and 220 kV overhead lines were not likely to result in significant noise impacts in their vicinity, but that 400 kV overhead lines do produce significant corona noise effects under certain conditions (especially at night under humid or wet conditions), with potential for noise impacts from such corona effects on properties located very close to such infrastructure in quiet rural locations. Steady state noise levels were also found in the vicinity of the boundaries of 110 kV, 220 kV and 400 kV substations.

3.3.2.3 Socially Sensitive Areas

Within Northern Ireland there are several areas that can be considered socially sensitive. There are 22 peace lines constructed as barriers separating neighbourhoods from one another, which have been built at urban interface areas in Belfast (16), Derry/Londonderry (3), Portadown (2) and Lurgan (1). There are 36 Neighbourhood Renewal Areas in Northern Ireland, which have been identified as deprived areas. Neighbourhood Renewal Partnerships have been key to creating local plans to improve everyday life for people in these areas. Neighbourhood Renewal Areas are found throughout Northern Ireland, although higher densities are found in Belfast and Derry/Londonderry.

Construction of permanent structures such as transmission lines and substations could have potential to lead to cumulative negative effects on already deprived and socially sensitive areas. However, there is also potential for increased employment within these areas resulting from construction and maintenance activities, as well as indirectly through effects on the supply chain. Furthermore, the provision of electricity to meet future needs within Northern Ireland will ensure the population receive secure and reliable electricity into the future.

3.3.2.4 Summary of Existing Pressures and Issues for Population and Human Health in Northern Ireland

According to the most recent State of the Environment report (2013), air and water quality pose little overall risk to public health in Northern Ireland[47]. However, recent research has indicated that the effects of air pollution on human health are more extensive and complex than previously thought[48], and a report by Public Health England in 2014 estimated that, in 2010, 553 deaths in the over-25s in Northern Ireland were attributable to exposure to anthropogenic air pollution ($PM_{2.5}$)[49]. Risks from radioactivity exposure are also considered very low and, while the health impacts of hazardous chemicals are not fully known, recent legislation regulating chemical supply and use ensures increased safeguarding of the population from health risks. The report considers noise to be an emerging environment and health issue (according to some WHO findings, noise is the 2nd largest environmental cause of health problems, just after the impact of air pollution (particulate matter))[50], as well as the effects of climate change, depletion of stratospheric ozone, biodiversity loss and land degradation.

Implementation of the draft TDPNI, and the construction and operation of electricity transmission projects therein, has the potential to lead to positive or negative effects on population health and settlement. Potential negative effects include localised construction-phase disturbance from noise, dust, etc., noise disturbance during operation of transmission infrastructure, or through posing a local physical constraint on development. Potential positive effects comprise a secure and reliable ability to provide electricity to meet the future needs of the Northern Ireland population.

[47] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

[48] https://www.daera-ni.gov.uk/clean_air_strategy_discussion_document

[49] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf

[50] https://ec.europa.eu/environment/noise/health_effects_en.htm

3.3.3 Geology, Soils & Land Use

Soils are a non-renewable resource, which provide vital ecosystem services such as: filtration and transformation of nutrients; storage of carbon; regulating flows and storing surface water; providing habitats; and supporting biodiversity and food production. Depending on their condition and land use, soils may be degraded, disturbed or lost through activities that result in compaction, poaching, erosion, sediment loss or changes in fertility. The building of any infrastructure, including electricity transmission infrastructure, can impact on the local soils and geology. Transmission development projects can have effects due to the variety of ground conditions that may be crossed, and the excavations involved.

It is considered that the key issues associated with implementation of the draft TDPNI and Geology, Soils and Land use comprise:

- Potential for effects on sensitive soils (e.g., peat).
- Potential for effects on sensitive land uses (e.g., cultivated lands, forests).
- Potential for interaction with contaminated land, mines or quarries.
- Potential effects of topography to risk of construction impacts.

3.3.3.1 Geology of Northern Ireland

3.3.3.1.1 Bedrock Geology

The geological landscape of Northern Ireland is remarkably varied considering its relatively small area of about 14,000km^2, and reflects the diverse geology on which it has been shaped. Northern Ireland has widespread geological deposits of relatively recent origin, known as superficial deposits, which formed during the last 2-3 million years of the Earths' history, spanning the Ice Ages and Interglacial periods. By far the most abundant of these are glacial sediments, made of mixtures of clay, silt, sand and gravel that were laid down by the repeated growth and decay of former ice sheets. Other sediments continue to form in lakes, rivers, estuaries and coastlines, whilst on high ground raised bogs of peat have steadily accumulated[51].

Below the superficial deposits, or with just a cover of soil where such deposits are absent, are older rocks which geologists broadly split into two distinct types: sedimentary bedrock and basement bedrock. Sedimentary bedrock geology consists of younger sequences, including limestones, sandstones and clays and older sequences, including sandstones, siltstones and mudstones. Basement geology (which underlies the sediment geology) consists of rocks that formed from the solidification of molten rock below volcanoes (igneous rocks) and sediments or intrusions that have changed as a result of high temperatures and pressures (metamorphic rocks).

At a high level, the bedrock geology of Northern Ireland (**Figure 3-4**) can be separated into four contrasting areas from oldest to youngest:

- The Sperrin Mountains in Derry/Londonderry and Tyrone contain the oldest basement rocks (Neoproterozoic);
- The Down-Longford area to the south-east is composed of basement rocks (Rhuddanian);
- The Lakelands in the south-west are predominantly a combination of various Palaeozoic sedimentary bedrock; and
- The Antrim Hills in the north-east contain the youngest sedimentary bedrock (Paleocene).

There are 148 ASSIs in Northern Ireland that are designated for, or partially for, their Earth Science interest, and may be considered as geological heritage. The one UNESCO world heritage site in Northern Ireland, the Giant's Causeway, is also designated for its unique geological heritage.

[51] https://www.bgs.ac.uk/download/regional-geological-summaries-northern-ireland/

3.3.3.2 Soil Types in Northern Ireland

Throughout Northern Ireland, superficial deposits are made up largely of peat, alluvium (clay, silt and sandstone) and till. A General Soil Map of Northern Ireland has been produced by the Agri-food and Biosciences Institute (AFBI)[52]. This map identifies 9 main soil types across Northern Ireland, as recognised by The World Reference Base map. These soils and their general occurrence are identified in **Table 3-6**.

Contaminants generally pass through high permeability, well-drained soils, such as Leptosols, Cambisols, Fluvisols etc., and can reach groundwater through locally and regionally important aquifers where they can be transported long distances. On the other hand, poorly draining and waterlogged soils, such as organic soils (peats), Stagnosols or Gleysols, cause increased surface run-off and siltation issues which can impact on downstream surface waterbodies. Stagnosols are the most abundant soil type across Northern Ireland in areas of lower elevation.

An evidence-based study was undertaken on the effects of high voltage transmission development on soils and geology[53]. As part of this study, a review of the literature regarding common impacts from linear developments such as pipelines, roads and overhead lines found that impacts on soils and geology are most likely to occur during the construction phase. The main negative impact from construction on soils and geology is soil movement due to shear failure, erosion, or wash-out of fine materials. This can result in sedimentation and siltation and often ends up in watercourses. Other impacts include contamination of soils or geological features by cement or fuel / oil spills during construction, while soil compaction and ground disruption are additional temporary impacts. Field surveys, undertaken as part of the evidence-based study, found no significant impacts on soils or geology from transmission projects during site visits; however, determined that this was influenced by the careful planning of these line routes to avoid sensitive areas. This survey included a range of soil types, with the expected worst-case site in an upland peat area with steep slopes (peat is naturally much weaker than mineral soils, owing to its low shear strength). Minor, localised impacts were found during construction on some of the sites studied, particularly associated with bad weather events that can increase the amount of soil released; however, in no case was there evidence of soil release post-construction. This study recommended that route planning avoids areas with soft / fine soils, as these are weaker and harder to construct on, and tend to have a higher risk of soil release.

[52] http://www.ukso.org/static-maps/soils-of-northern-ireland.html

[53] RPS Group 2014. EirGrid Evidence Based Environmental Studies Study 7: Soils and Geology. Literature review and evidence based field study on the effects of high voltage transmission development on soils and geology.

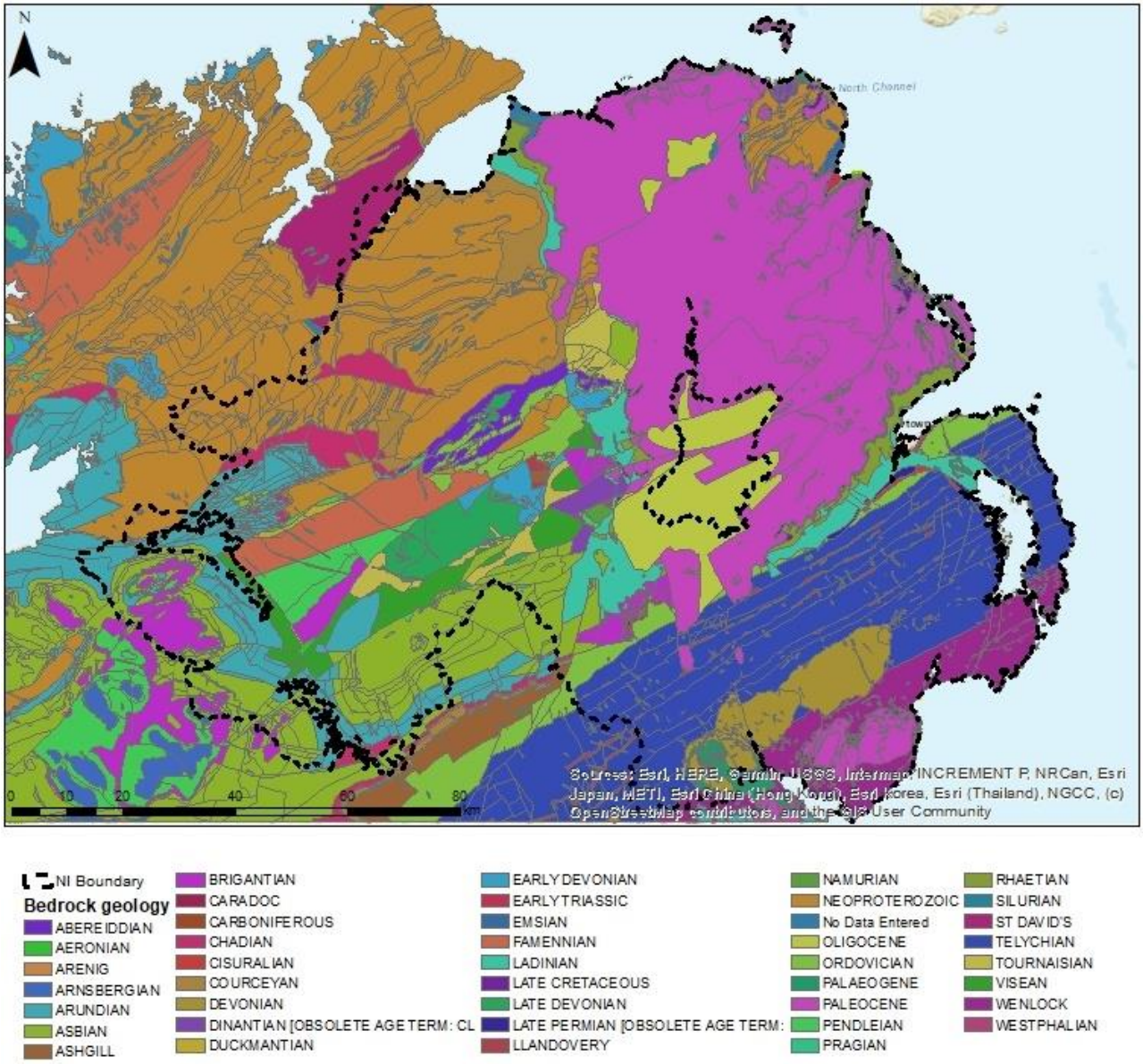


Figure 3-4 Bedrock geology mapping across Northern Ireland by age

Table 3-6 AFBI World Reference Base soil types across Northern Ireland

AFBI World Reference Base	General occurrence across Northern Ireland
Arenosols (sandy-textured soils that lack any significant soil profile development).	Located in coastal areas such as Murlough in County Down and Portrush in County Antrim.
Cambisols (soil in the beginning of soil formation)	Most prevalent in the south-east, around County Down.
Fluvisols (genetically young soil in alluvial deposits).	Generally widely dispersed across Northern Ireland in small pockets.
Gleysols (wetland soils, which in the natural state are continuously water-saturated within 50 cm of the surface, for long periods of time).	Generally occur in small, isolated pockets across Northern Ireland.
Histosols (soil consisting primarily of organic materials).	Generally present in the north-west, around the Sperrin Mountains and in the Antrim Hills.

Leptosols (shallow soils with minimal development, formed typically on hard rock or highly calcareous materials).	Generally most prevalent in the south-east, around the Mourne Mountains and surrounding Strangford Lough.
Podzols (soils with an ash-grey subsurface horizon, bleached by organic acids, on top of a dark accumulation horizon with brown or black illuviated humus and/or reddish iron compounds).	Most prevalent in the south-east and west.
Stagnosols (soil with strong mottling of the soil profile due to redox processes caused by stagnating surface water).	Most abundant soil type, which is present across Northern Ireland but most dominant in the south and south-west.
Urban (soil material having a non-agricultural, man-made surface layer more than 50 cm thick).	Mostly present around the Greater Belfast, Bangor and Lisburn urban areas.

3.3.3.3 Topography and Land Use in Northern Ireland

The topography of Northern Ireland is such that areas of lower elevation are predominantly located within the centre, where the largest lake in the British Isles, Lough Neagh, is situated. In all directions from this point, the land generally becomes steeper, culminating in highland regions on all sides. The Antrim Hills, which reach a height of over 550m at Trostan, are to the north and east. In the south-east, the rounded landscape of drumlin hills is punctuated by Slieve Croob in County Down and culminates in the Mourne Mountain range which rises to its highest point at Slieve Donard at over 850m in elevation.

Land use in Northern Ireland, as identified within the Corine Dataset, is shown in **Figure 3-5** and summarised in **Table 3-7**. The predominant land use is 'Pastures' (8,889 km^2), followed by 'Natural grassland' (1024 km^2), 'Moors and heathland' (640 km^2) and 'Peat bogs' (550 km^2). Pastures, which comprise approximately 63% of land cover across Northern Ireland, are located across the country, with the exception of upland areas such as the Mourne Mountains in the south-east, the Antrim Hills in the north-east, the Sperrins in the west and raised bog peatland areas in mid-Ulster.

Areas of sensitive land use and soils for transmission infrastructure development in Northern Ireland have been identified as cultivated lands, peatlands, ancient woodland and commercial forestry. Land use across Northern Ireland is dominated by agricultural use, and most transmission infrastructure is routed across / located within agricultural lands. There is approximately 10,000 km^2 of agricultural land in Northern Ireland; comprised of pastures, complex cultivation patterns, land principally occupied by agriculture, non-irrigated arable land and annual crops associated with permanent crops. There is over 1,300 km^2 of peatland in Northern Ireland, most of which is in the western and northern areas of the country. There is over 750 km^2 of forestry lands and over 110 km^2 of ancient woodland within Northern Ireland.

Additional land types and land uses that may be constraints to transmission development include quarries, mines, landslide areas, unstable grounds, and potentially contaminated sites. There are over 237 active quarries within Northern Ireland, the majority of which extract sand and gravel, along with mines which extract limestone, basalt and igneous rock, and clay and shale. There are also 660 known historic mines within Northern Ireland. Landslides and unstable ground materials are present throughout the country and may provide unsuitable areas for stable foundations of infrastructure. Potentially contaminated sites include those from historic industrial operations and existing Pollution Prevention and Control (PPC) sites. There are over 14,500 potentially contaminated sites from historic operations and over 483 PPC sites within Northern Ireland. Development of infrastructure through or on these sites has the potential for mobilising contaminants to other areas, including into water bodies.

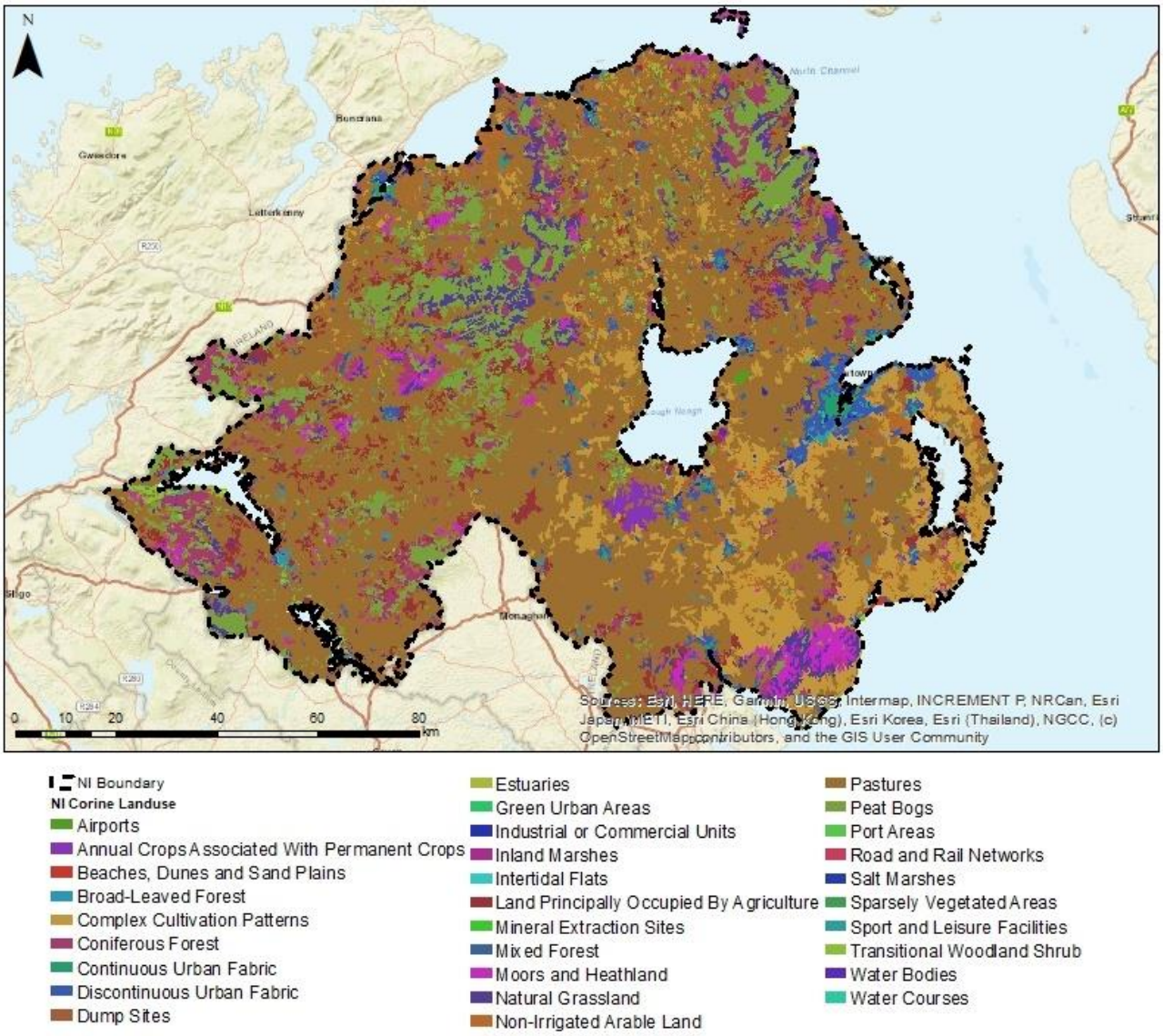


Figure 3-5 Corine land use mapping across Northern Ireland

Table 3-7 Dominant Land Cover Types within Northern Ireland

Land Cover Class	Total Land Cover (km^2)	% of Total
Pastures	8,889	63
Complex Cultivation Patterns	227	2
Peat Bogs	550	4
Land Principally Occupied by Agriculture	243	2
Natural Grassland	1024	7
Coniferous Forest	463	3
Moors and Heathland	640	5

Non-Irrigated Arable Land	405	3
Urban (Continuous urban fabric)	30	0
Sub-urban (Discontinuous urban fabric)	249	2

3.3.3.4 Summary of Existing Pressures and Issues for Geology, Soils and Land Use in Northern Ireland

Existing pressures and issues for geology across Northern Ireland relate to the presence of permeable sedimentary bedrock or where the occurrence of fracture flows results in highly productive aquifers, such as those in the north-east Antrim Hills and south-west Fermanagh Lakelands. Where these areas are overlain by freely draining soils, contaminants may be leached into groundwater or into nearby water bodies and therefore may be transported considerable distances from their source. In general, the areas of highest groundwater vulnerability are those with bedrock outcrops present, or where glacial sand and gravels are present, particularly in areas of higher elevation such as the Antrim Hills, Mourne Mountains and Sperrin Mountains. In poorly draining or waterlogged soils, contaminants can be mobilised during runoff and erosion and, as such, streams, lakes and other water bodies in the vicinity of the source are at highest risk. This is particularly important, given that Stagnosols (which are given their name due to stagnating surface water) are the most abundant soil type across Northern Ireland, particularly in areas of lower elevation.

Electricity transmission developments, undertaken through implementation of the draft TDPNI, have the potential for impacts on soils and geology alone, or in combination with existing pressures, associated with construction phase impacts on soil movement, or contamination. The development of transmission infrastructure is all within shallow workings and is unlikely to have any impacts on geology or geological heritage within Northern Ireland; however, it is still best if the more sensitive areas can be avoided. Some soils and land use types are particularly susceptible to development, including peatlands and soft / fine soils, while steep slopes increase the risk of soil movement and loss, which may result in sedimentation and siltation to nearby watercourses, impacting on water quality. This can have medium to long term impacts in some cases, dependent upon the soil and geology of the area, as erosion can continue after construction has been completed. Unstable lands and previous landslide areas should be avoided, where possible, to prevent the construction of infrastructure on unsound material. Similarly, the development of infrastructure at higher elevations and on steep slopes can provide significant technical issues. Transmission infrastructure development may also lead to the contamination of soils or geological features by cement or fuel spills during the construction phase, or the accidental transfer of materials along a construction corridor from contaminated sites.

3.3.4 Water

Water is essential for the maintenance of biodiversity, supports the population through the provision of drinking water and supports many of our core activities[54]. Although there have been improvements in drinking water quality and water utility discharge quality, and a decrease in incidents of water pollution, the most recent status of WFD surface water bodies in Northern Ireland (2021) highlights that none have achieved a good or high overall status[55]. While the overall failure for any water bodies to achieve a good or high status relates to an update in the monitoring of persistent chemicals, as discussed below, pressure assessments have identified that two significant pressure sources related to nutrients are continuing to prevent the achievement of good status for water bodies: agricultural activities and sewage-related problems[56].

[54] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

[55] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NI%20Water%20Framework%20Directive%20Statistics%202021_0.pdf

[56] Draft 3rd cycle River Basin Management Plan for Northern Ireland 2021-2027_0.PDF (daera-ni.gov.uk)

It is considered that the key issues associated with implementation of the draft TDPNI and Water comprise:

- Potential for effects on the status of WFD surface water bodies or marine water bodies during construction (via pollution or sedimentation).
- Potential for effects on the status of WFD Protected Areas, including for water-dependent habitats and species, economically significant aquatic species, drinking water, recreation, and nutrient sensitive areas.
- Potential for interaction with areas of flood risk (fluvial, pluvial or coastal).

3.3.4.1 WFD Surface Water Bodies and Protected Areas in Northern Ireland

The EU Water Framework Directive (WFD) (2000/60/EC), transposed in Northern Ireland through 'The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017' the "WFD Regulations", established a new legal framework for the protection, improvement and sustainable use of rivers, lakes, transitional waters, coastal waters and groundwater across Europe. This was undertaken to prevent deterioration and to enhance the status of aquatic ecosystems, promote sustainable water use and reduce pollution. The WFD is implemented through River Basin Management Plans (RBMPs). Northern Ireland has three River Basin Districts (RBDs): North Western RBD, Neagh Bann RBD and North Eastern RBD. The Water (Amendment) (EU Exit) Regulations 2019 ensure that the WFD (as transposed) and the supporting pieces of water legislation continue to operate in Northern Ireland following the UK's exit from the EU; as the preparation and implementation of a RBMP is a key part of the implementation of the WFD Regulations, this process will continue within Northern Ireland.

The WFD Regulations require the production and implementation of a RBMP for Northern Ireland in six yearly cycles. The most recent is the draft third cycle RBMP (2021), which runs from 2021-2027. This classifies the status of all WFD surface water bodies according to chemical, biological and hydromorphological parameters, providing an overall status of either 'High', 'Good', 'Moderate', 'Poor' or 'Bad' for each surface water body (if the surface water bodies have been designated as artificial or heavily modified, they are classified using ecological 'potential' rather than ecological 'status'). 'Water Bodies' are the basic management units for reporting and assessing compliance with the environmental objectives of the WFD Regulations. There are 496 WFD surface water bodies in Northern Ireland, comprising 450 rivers, 21 lakes and 25 transitional and coastal waters.

There are 75 WFD groundwater bodies in Northern Ireland (66 bedrock and 9 superficial), comprised of 45 in the North Western RBD, 14 in the North Eastern RBD and 16 in the Neagh Bann RBD. Under the WFD, groundwater bodies are classified as 'good' or 'poor' status for quantitative and chemical status, and overall good status requires that both the quantitative and chemical status are good.

The third cycle RBMP for Northern Ireland 2021-2027 will identify those water bodies which can be classified as being at 'good or better' status and set objectives and a programme of measures for the next six-year cycle to help improve those water bodies which are classified as below 'good' status. This is currently at a draft stage, however an updated classification for water bodies was published in December 2021 in the WFD Statistics Report prior to the production of the third cycle RBMP 2021-2027[57]. This report highlights that there have been significant changes in the monitoring and overall classification for rivers, lakes and transitional and coastal water bodies. New priority substances were introduced into the monitoring programme in 2018, and the 'chemical status assessment' no includes the presence of ubiquitous, persistent, bioaccumulative, toxic (uPBT) substances. Although a number of these substances are now banned or have restricted use, their widespread past use has resulted in accumulation in the aquatic environment and breaching of Environmental Quality Standards (EQS). These substances were found at all monitoring stations, and uPBT failures were extrapolated to all surface water bodies across Northern Ireland; as the 'Overall Surface Water Status' from 2021 will incorporate the chemical classification including uPBT substances, as well as cypermethrin failures, this has resulted in no water bodies meeting a good or high 'Overall Surface Water Status'.

[57] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NI%20Water%20Framework%20Directive%20Statistics%202021_0.pdf

Table 3-8 compares the number and percentage of water bodies within the North Eastern, Neagh Bann and North Western RBDs at good or high status in 2015, 2018 and 2021. This indicates the following:

- River status – In 2015, 33% of the 450 river water bodies in Northern Ireland were classified as good or high overall status. In 2018, 31% were classified as good or high overall status. In 2021, no river water bodies achieved good or high overall status. Considering ecological status, 32% of river water bodies achieved good or high ecological status in 2021, in comparison to 31% in 2018 and 33% in 2015. In addition, when the chemical status of river water bodies is considered excluding uPBT substances and cypermethrin for comparative purposes, 93% achieved good chemical status in 2021, compared to 91% in 2018 and 52% in 2015.

- Transitional and Coastal status – In 2015, 36% of the 25 transitional and coastal water bodies were classified as good or high overall status. In 2018, 40% were classified as good or high overall status. In 2021, no water bodies achieved good or high overall status. Considering ecological status, 40% of water bodies achieved good ecological status in 2021, in comparison to 40% in 2018 and 3% good and 6% high status in 2015. In addition, when the chemical status of water bodies is considered excluding uPBT substances and cypermethrin for comparative purposes, 88% achieved good chemical status in 2021, compared to 44% in 2018 (of 16 assessed water bodies) and 20% in 2015 (of 16 assessed water bodies).

- Lake status – In both 2015 and 2018, 24% of the 21 lake water bodies were classified as good overall status. In 2021, no lake water bodies achieved good or high overall status. Considering ecological status, 14% of water bodies achieved good ecological status in 2021, in comparison to 24% achieving good or high status in 2018 and 2015. In addition, when the chemical status of water bodies is considered excluding uPBT substances and cypermethrin for comparative purposes, in 2015, 2018 and 2021, all 21 (100%) lake water bodies were classified as good chemical status.

- Groundwater body status- In 2015, 65% of the 75 groundwater bodies achieved good overall status, while in 2021 68% achieved good overall status.

The results of the draft third cycle RBMP classification mean that Northern Ireland will not achieve the objective to have 70% of its water bodies at 'good or better' status. Little improvement has occurred since 2015; at that time 37% of all water bodies were at good or high status. While the failure of all surface water bodies to achieve good or high status in 2021 primarily relates to the changes in monitoring and inclusion of additional priority substances, comparison of ecological status shows little to no change in status from the previous cycle, and a decline in status for lake water bodies. Pressure assessments undertaken have identified that the main pressures acting upon the water environment in Northern Ireland are nutrient pressures, relating primarily to agricultural activities and sewage-related problems[58].

Figure 3-6 illustrates the most recent digitally available (2018) ecological status of WFD surface water bodies (i.e., river, lake, transitional and coastal water bodies), and **Figure 3-7** the most recent digitally available (2020) status of groundwater bodies within Northern Ireland.

[58] https://www.daera-ni.gov.uk/sites/default/files/consultations/daera/Draft%203rd%20cycle%20River%20Basin%20Management%20Plan%20for%20Northern%20Ireland%202021-2027_0.PDF

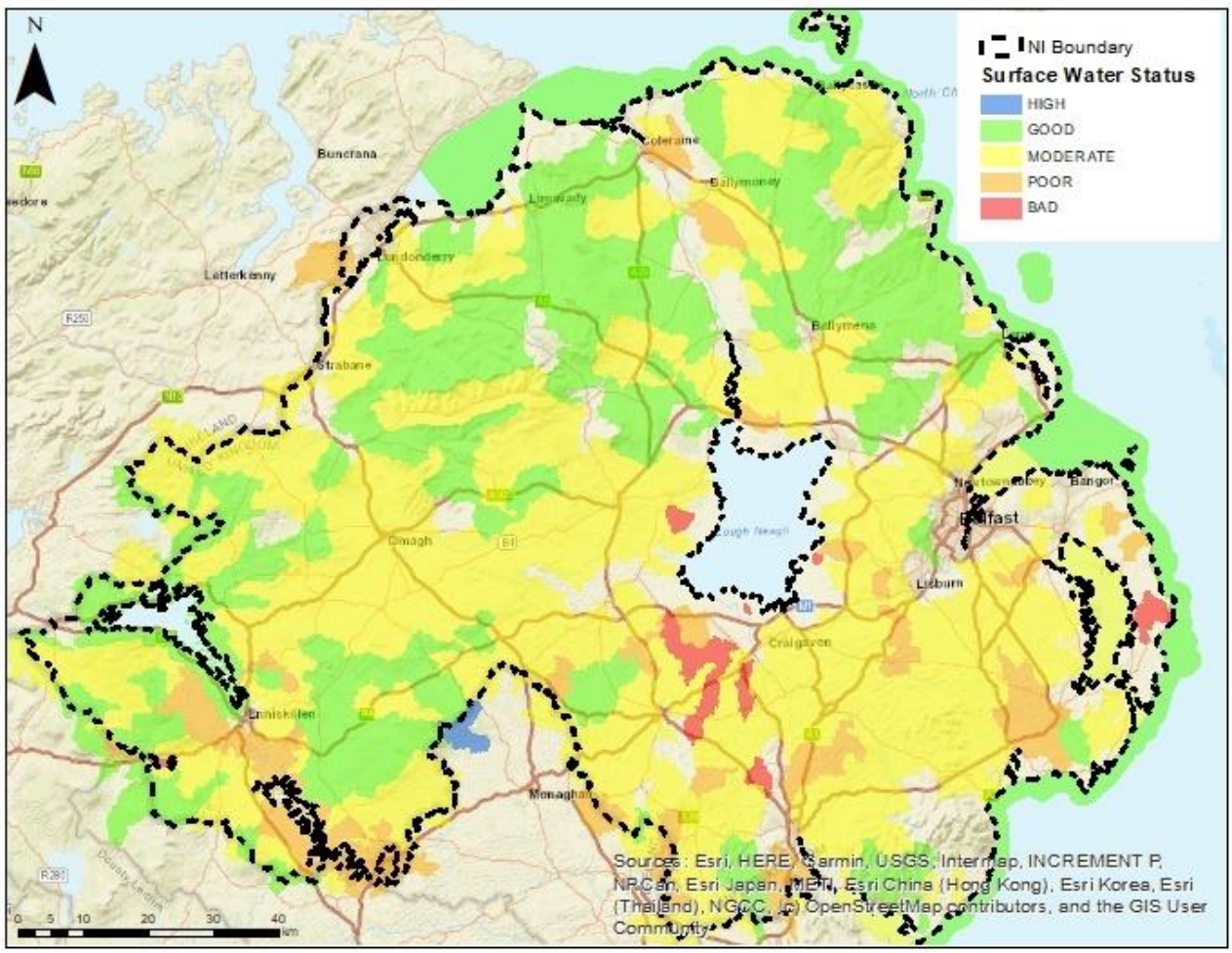


Figure 3-6 WFD Surface Water Ecological Status 2018

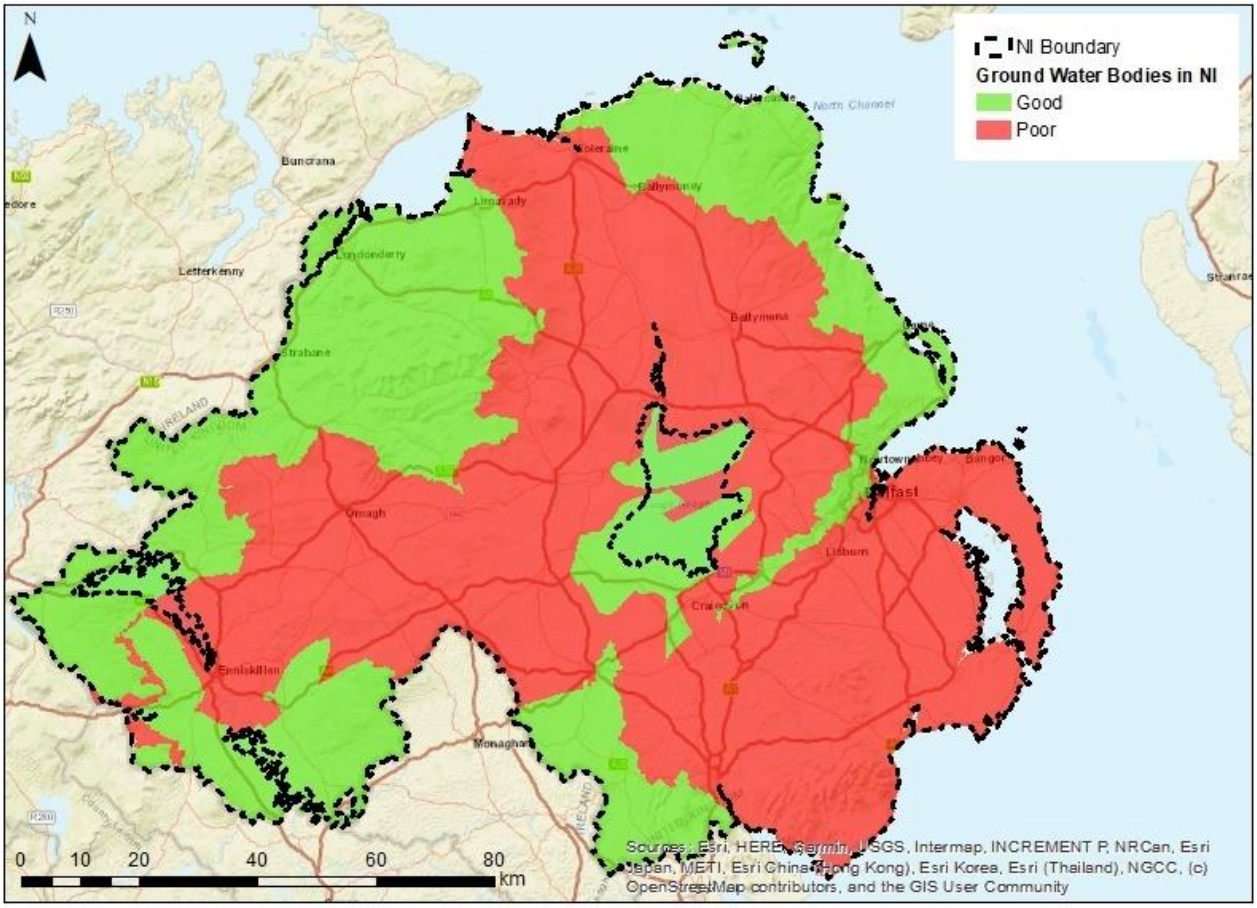


Figure 3-7 WFD status of groundwater bodies in Northern Ireland 2015

Table 3-8 Comparison of WFD Water Bodies at 'Good or Better' Status for 2015 and 2018

	No. in NW IRBD	No. in NB IRBD	No. in NE RBD	Northern Ireland	
				No.	%
Rivers 2015	74	54	18	147	33
Rivers 2018	68	56	17	141	31
Rivers 2021	0	0	0	0	0
Transitional & coastal 2015	1	1	7	9	36
Transitional & coastal 2018	1	2	7	10	40
Transitional & coastal 2021	0	0	0	0	0
Lakes 2015	2	2	1	5	24
Lakes 2018	2	2	1	5	24
Lakes 2021	0	0	0	0	0

Groundwater 2015	37	6	6	49	65
Groundwater 2021	36	10	5	51	68
All water bodies 2015	115	63	32	210	37
All water bodies 2018/2020	111	70	34	215	38

The WFD Regulations required the establishment of a register of protected areas for Northern Ireland, for water bodies, or parts thereof, that require additional water quality protection owing to their importance to people or wildlife. This is outlined in Article 10 of the WFD Regulations.

The register comprises the following protected areas:

a) A drinking water protected area.

b) An area or body of water requiring special protection in accordance with any EU instrument protecting surface water, groundwater or conservation of habitats and species, including:

   (i) Areas designated for the protection of economically significant aquatic species (including shellfish water protected areas).

   (ii) Bodies of water designated as recreational waters.

   (iii) Nutrient-sensitive areas.

   (iv) Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection.

The WFD protected areas in Northern Ireland are summarised in **Table 3-9**.

Table 3-9 WFD Register of Protected Areas

WFD Protected Area Type		North Eastern RBD	North Western IRBD	Neagh Bann IRBD	Total Number
Drinking Water Protected Areas	Surface water	8	10	8	26
	Groundwater	10	42	13	65
Shellfish Water Protected Areas		7	2	1	10
Bathing Waters		22	3	1	26
Urban Waste Water Sensitive Areas		16	4	3	23
Water Dependent Protected Areas		25	27	24	66*
Groundwater-dependent terrestrial ecosystems		2	5	2	9

*Note: some protected sites straddle more than one RBD, hence the NI total does not equal the sum of the RBDs.

As discussed in Section 4.3.1, evidence-based studies[59] have been completed to determine the impact of transmission development on water quality and aquatic ecology, in the Republic of Ireland. These studies indicated that sediment release is the most significant risk to water quality from transmission infrastructure projects, occurring when land is being cleared for construction, through erosion and run-off. Pollutants can also come from concrete and hydrocarbons used in the foundations for towers and for culverts and can result in an increased sediment load and a lowering of the pH of surface water bodies, with implications for sensitive species including freshwater pearl mussel and species of aquatic plants. Impacts particularly result from construction works near to watercourses that have limited to no buffer zones, from site clearance, from damage or alteration to riverbanks / riparian zones and from site flooding.

3.3.4.2 The Marine Strategy and Marine Planning

The Marine Strategy Regulations 2010 require action to be taken to achieve or maintain Good Environmental Status (GES) in marine waters within the marine strategy area by 2020. GES is defined in the Regulations as "the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations".

The Marine Strategy Regulations required the production of a marine Strategy for UK waters, coordinated across the four UK Administrations. The Strategy aims to help in the delivery of international obligations and commitments such as those under the UN Convention on the Law of the SEA (UNCLOS), UN Sustainable Development Goal 14, OSPAR Strategy and Convention on Biological Diversity, and the OSPAR North-East Atlantic Environment Strategy (NEAES) 2030. The UK Marine Strategy applies an ecosystem–based approach to the management of human activities, and considers the following 11 quality descriptors:

- D1 – Biological diversity (cetaceans, seals, birds, fish, pelagic habitats and benthic habitats)
- D2 – Non-indigenous species
- D3 – Commercially-exploited fish and shellfish
- D4 Food webs (cetaceans seals, birds, fish and pelagic habitats)
- D5 – Eutrophication
- D6 – Sea-floor integrity (benthic habitats)
- D7 – Hydrographical conditions
- D8 – Contaminants
- D9 – Contaminants in fish and other seafood
- D10- Marine litter
- D11 – Underwater noise

The UK Marine Strategy comprise three parts, to be updated every six years: assessment, monitoring programmes and a programme of measures. The first UK assessment of our seas was published in 2012[60], and set objectives, targets and indicators for achieving GES; this was updated in 2019[61], and the status of descriptors for the UK is summarised in **Table 3-10**.

[59] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 6: Water Quality and Aquatic Ecology. Literature and evidence based field studies on the effects of high voltage transmission lines on water quality and aquatic ecology in Ireland.

[60] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69632/pb13860-marine-strategy-part1-20121220.pdf

[61] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/921262/marine-strategy-part1-october19.pdf

Table 3-10 UK Assessment of Environmental Status for the MSFD

Descriptor	GES Achieved	Trend	Description
D1 & D4 Cetaceans	Partially	Stable/mixed	Achievement of GES uncertain. Status of coastal bottlenose dolphin & minke whale consistent with GES in the Greater North Sea, but unknown/uncertain elsewhere. Unknown if GES achieved for other species. Fisheries bycatch is an ongoing pressure; the target for cetacean bycatch (indicated by harbour porpoise bycatch) has been met in the North Sea, but in the Celtic Seas it is likely to have exceeded the precautionary threshold.
D1 & D4 Seals	Partially	Improving	GES achieved for grey seals in the Greater North Sea and Celtic Seas. Harbour seals have not achieved GES in the Greater North Sea; in the Celtic Sea, significant increase in West Scotland but status uncertain in other areas.
D1 & D4 Birds	No	Declining	GES achieved for non-breeding waterbirds in the Greater North Sea but not the Celtic Sea. Breeding seabirds have not achieved GES.
D1 & D4 Fish	No	Improving	Demersal fish communities recovering from past over-exploitation, but GES not yet achieved in the Greater North Sea or Celtic Seas. Partial assessment of pelagic shelf fish did not provide a clear result.
D1 & D4 Pelagic Habitats	Partially	Stable/mixed	Achievement of GES uncertain; prevailing environmental conditions likely driving changes in plankton communities but influence of human activities not certain.
D1 & D6 Benthic habitats	No	Stable/mixed	GES achievement uncertain for intertidal & soft sediment habitats; for soft sediments, the level of physical damage are considered consistent with GES in UK waters to the west of the Celtic Seas but not in the Celtic Seas or the Greater North Sea. GES not achieved for sublittoral rock and biogenic habitats.
D2 Non-indigenous species (NIS)	No	Stable/mixed	GES not achieved. Ability to detect new NIS has improved but no significant change in the number of new records of NIS between 2003 and 2014.
D3 Commercial fish	No	Improving	GES achieved for some commercially exploited fish. In 2015, 53% of marine fish (quota) stocks fished below maximum sustainable yield (MSY) and has increased significantly since 1990. Most national shellfish stocks have not achieved GES or their status is uncertain.
D4 Food webs	Partially	Improving	Extent to which GES has been achieved is uncertain, components of the marine food web are changing but it is not clear how they are affecting each other.
D5 Eutrophication	Yes	Stable/mixed	GES largely achieved. A small number of problems remain in coastal and estuarine waters, representing 0.03% of the UK EEZ and 0.41% of estuarine and coastal waters.

D7 Hydrographical conditions	Yes	Stable/mixed	GES continuing to be achieved.
D8 Contaminants	Yes	Improving	GES largely achieved. Concentration of hazardous substances and their biological effects generally meeting agreed target thresholds. Highly persistent legacy chemicals cause of new failures, mainly in coastal waters close to polluted sources.
D9 Contaminants in seafood	Yes	Improving	GES achieved, high level of compliance with agreed safety levels.
D10 Marine litter	No	Stable/mixed	GES not achieved. Beach litter levels in the Celtic Seas largely stable since assessment in 2012, whilst levels in the Greater North Sea have slightly increased.
D11 Underwater noise	Partially	Stable/mixed	Achievement of GES is uncertain, but research and monitoring programmes are improving understanding.

Consideration should be given to the potential for impacts on marine descriptors when planning for transmission infrastructure in coastal or marine environments. In addition, the Marine and Coastal Access Act (2009) and the Marine Act (NI) 2013, required DAERA to prepare marine plans, for the better management of the Northern Ireland marine area and to facilitate the sustainable development of the marine area. The draft Marine Plan for Northern Ireland[62] has set out 'Key Activity' policies, including for energy. Under this plan, there is a presumption in favour of energy proposals that improve the security and diversity of energy supply, where it can be demonstrated that:

a) There will be no unacceptable adverse impact throughout the lifetime of the proposal on marine activities, uses and / or the marine area and any potential adverse impact is, in order of preference, avoided, minimised and / or mitigated; and

b) Restoration / decommissioning measures have been agreed, where necessary.

3.3.4.3 Flood Risk in Northern Ireland

The Floods Directive (2007/60/EC), implemented in Northern Ireland through 'The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009' and amendments, the "Floods Directive Regulations" requires the establishment of a framework for the assessment and management of flood risks, with the aim of reducing the adverse consequences of flooding on human health, the environment, cultural heritage and economic activity. This works on a six-year cycle of flood risk assessment, prioritisation, updated flood mapping and planning for flooding. As part of the second cycle of flood risk management planning, the Northern Ireland Flood Risk Assessment (NIFRA) 2018[63] reviewed the situation regarding flood risk within Northern Ireland. It identified that the main sources of flooding within Northern Ireland are rivers (fluvial flooding), the sea (coastal flooding), and overland surface water flows (pluvial flooding). In total, the NIFRA 2018 identified that approximately 45,000 properties, comprising 5% of the total in Northern Ireland, are at risk from flooding from these sources.

The NIFRA 2018 identified twelve Areas of Potential Significant Flood Risk (APSFRs). The names of these areas, along with the RBD in which they are located are listed in **Table 3-11**, and they are shown in **Figure 3-8**. The Northern Ireland Flood Risk Management Plan (FRMP) 2021-2027 is the second cycle Plan for Northern Ireland. It focuses on planning for measures to manage flood risk in these twelve APSFRs.

[62] https://www.daera-ni.gov.uk/sites/default/files/consultations/daera/Marine%20Plan%20for%20NI%20final%2016%2004%2018.PDF

[63] https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/northern-ireland-flood-risk-assessment-report-2018-updated-may2019.pdf

Table 3-11 Areas of Potential Significant Flood Risk in Northern Ireland

APSFR Name	River Basin District
Belfast	North Eastern RBD
Londonderry	North Western IRBD
Newry	Neagh Bann IRBD
Lurgan	Neagh Bann IRBD
Glengormley and Mallusk	Neagh Bann IRBD
Larne	North Eastern RBD
Bangor	North Eastern RBD
Portadown and Craigavon	Neagh Bann IRBD
Omagh	North Western IRBD
Newtownabbey	North Eastern RBD
Carrickfergus	North Eastern RBD
Ballymena	Neagh Bann IRBD

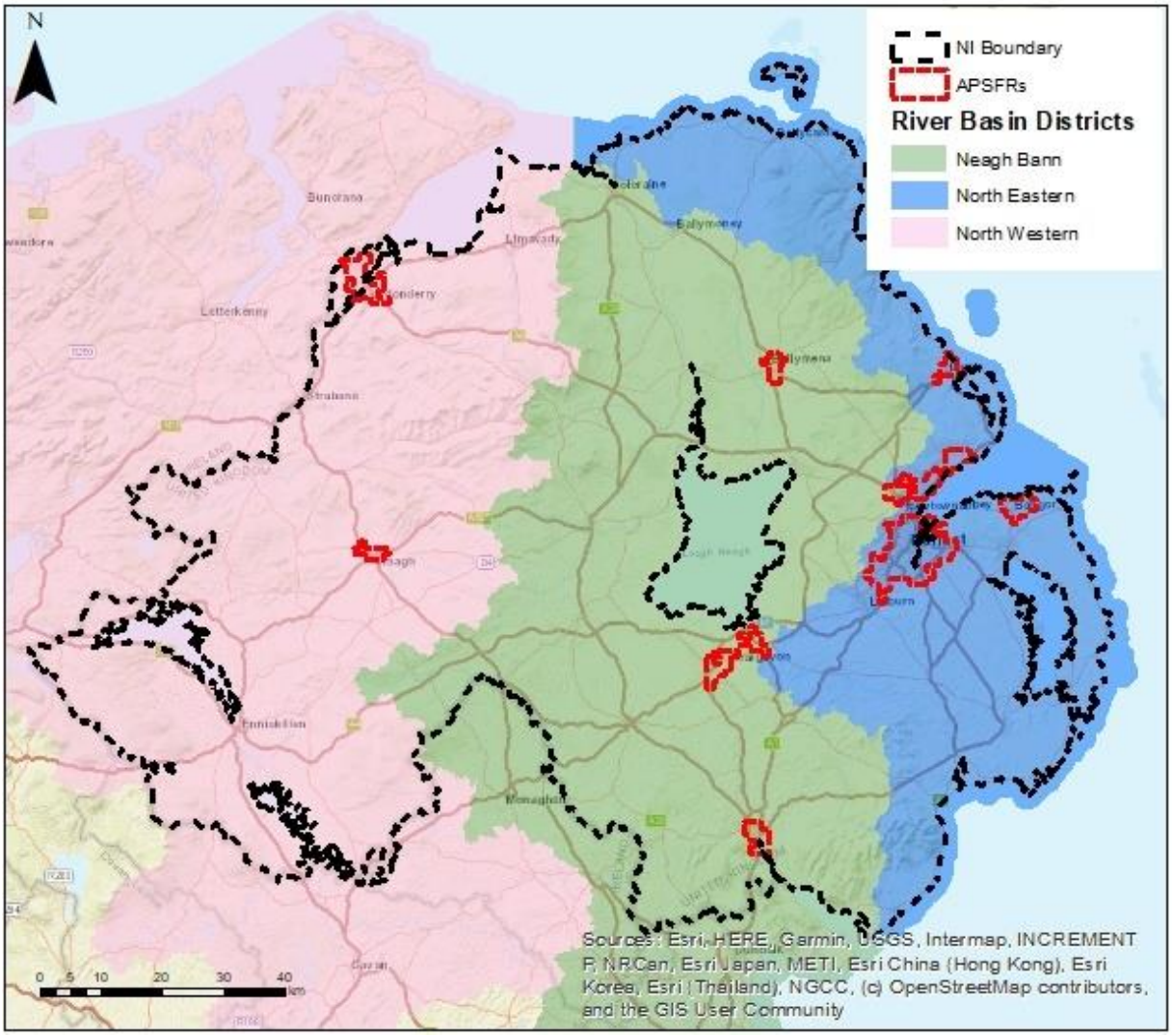


Figure 3-8 Location of Areas of Potential Significant Flood Risk in Northern Ireland

Owing to the large number of rivers within Northern Ireland, there is a significant degree of fluvial flood risk, particularly in relation to large rivers such the River Foyle and those which feed Lough Neagh, such as the River Bann. Fluvial flooding occurs when the channel capacity of rivers is exceeded, and water overtops the riverbanks and flows across the natural floodplain of the river. The impact of fluvial flooding is significantly greater within urban and suburban areas (such as Belfast, Portadown, Derry/Londonderry and Strabane), in part due to the density of receptors and the impact of land use upon drainage patterns. Significant risk of surface water (pluvial) and coastal flooding also exists throughout Northern Ireland. Significant coastal flooding is relatively rare in Northern Ireland but can potentially cause major damage in low lying areas, with effects of saltwater inundation causing long term economic and environmental damage. Pluvial flooding results from rainfall that has not reached, or has overwhelmed, man-made drainage systems, and leads to overland flows and ponding within low-lying areas. It can be exacerbated by the extensive areas of hard, impermeable surfaces that are frequently present within urban areas. Consideration needs to be given to such flood risks in planning for transmission infrastructure to avoid the poor siting of facilities, risk of inundation or knock-on flooding to local receptors or material assets.

Where infrastructure is proposed near the coast, the following statements from the UK Marine Policy Statement apply:

- Adapting to the impacts of climate change will also be a priority for terrestrial planning at the coast. Marine planning will need to be compatible with these impacts. This will include ensuring inappropriate types of development are not permitted in those areas most vulnerable to coastal change, or to flooding

from coastal waters, while also improving resilience of existing developments to long-term climate change (Section 2.6.7.4).

- Marine plan authorities should consider existing terrestrial planning and management policies for coastal development under which inappropriate development should be avoided in areas of highest vulnerability to coastal change and flooding. Development will need to be safe over its planned lifetime and not cause or exacerbate flood and coastal erosion risk elsewhere (Section 2.6.8.5).
- Marine plan authorities should be satisfied that activities and developments will themselves be resilient to risks of coastal change and flooding and will not have an unacceptable impact on coastal change. A precautionary and risk-based approach, in accordance with the sustainable development policies of the UK Administrations, should be taken in terms of understanding emerging evidence on coastal processes (Section 2.6.8.4).
- The planning system should therefore help to mitigate and adapt to climate change by ... avoiding development in areas with increased vulnerability to the effects of climate change, particularly areas at significant risk from flooding, landslip and coastal erosion and highly exposed sites at significant risk from impacts of storms (Strategy Planning Policy Statement Section 3.13).

3.3.4.4 Summary of Existing Pressures and Issues for Water in Northern Ireland

The most recent State of the environment report for Northern Ireland states that industry, power generation, agriculture and forestry, development, transport and infrastructure pressures all potentially impact on Northern Ireland's water environment[64]. Under the WFD, pressures on the quality of the water environment have been assessed according to two types, as follows:

- Point source pollution pressures on water quality – e.g., effluent discharges arising from industry and WWTWs; sewer overflows during heavy rainfall events; and
- Diffuse source pollution pressures on water quality – e.g., contaminated surface run-off from roads, construction sites, fuel storage areas; septic tank discharges; acid and nutrient deposition from the air; run-off of pesticides, soils and nutrients from agriculture and forestry, and migration of these to groundwaters and surface waters.

Abstractions and impoundments of water for drinking water supply, industry, agriculture, recreation, and hydropower can lead to pressures on water quantity and flow and can exacerbate existing water quality issues. The introduction and spread of invasive non-native species, including aquatic plants such as Floating Pennywort and Curly Waterweed, can impact upon native aquatic biodiversity, and can adversely affect water-based recreational activities. The risk of flooding following heavy rainfall events can be increased by land management practices that influence water storage potential and run-off, such as in urban areas where impermeable surfaces are common. Flood events can also lead to increased run-off of sediments and pollutants from agricultural lands, with consequences for receiving water quality, while land management practices can have a significant influence on flood risk in downstream areas.

Implementation of the draft TDPNI, and potential transmission development projects therein, has the potential to lead to negative effects on the quality of water bodies in Northern Ireland (as well as to cross-border water bodies in the Republic of Ireland) alone, or in combination with, these existing pressures. Consideration should be given to the potential impact of transmission infrastructure upon the water environment. Impacts might include changes to waterbody morphology (with the potential to impact upon issues such as bank stability and vegetation, the riparian buffer zone and infiltration of riverbed substrate with silt and fines), water quality (and thus aquatic ecology), water flows and levels and the presence of invasive species. The sensitivity of waterbodies will dictate the significance of impacts upon the water environment. Consideration should also be given to areas of flood risk when planning for transmission infrastructure projects, to avoid siting these in areas of risk, or affecting flood risk to other receptors.

[64] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

3.3.5 Air

Good air quality is vital for human health and wellbeing, for our climate, habitats and built environment. Air pollution is the result of a range of substances that are introduced into the atmosphere from a variety of different sources. On the whole, air quality in Northern Ireland has improved significantly over the past few decades; in particular, concentrations of sulphur dioxide, originating from the combustion of coal and oil, has reduced. However, some pollutants are continuing to exceed air quality objectives. This has consequences on both human health and on some of our most important habitats that are sensitive to the effects of atmospheric pollutant deposition.

It is considered that the key issues associated with implementation of the draft TDPNI and air comprise:

- Potential for localised effects of air pollutants during the construction phase (plant emissions).
- Potential for localised noise effects during construction and operation.
- Potential for a reduction in emissions from power stations owing to new renewable energy connections.

3.3.5.1 Air Quality in Northern Ireland

Air quality is monitored regularly at 21 stations within Northern Ireland. At each of these locations, levels of pollutants including Nitrogen dioxide (NO_2), Nitric oxide (NO), Nitrogen oxides as nitrogen dioxide (NOX as NO_2), Ozone (O_3), PM_{10} particulate matter, $PM_{2.5}$ particulate matter, Sulphur dioxide (SO_2), and Carbon monoxide (CO) are monitored, and measured with regard to EU Air Quality Directives and the 2007 UK Air Quality Strategy (AQS) objectives. Data is available regarding the pollutants monitored at 19 of these sites, and the latest measured air quality is shown in **Table 3-12**[65].

Table 3-12 Air pollution monitoring sites and pollutants measured in Northern Ireland

Monitoring Site	Pollutants monitored	Latest pollution level*
Derry Dale's Corner	NO_2, NO, NOX as NO_2	Low (NO_2)
Derry Rosemount	O_3, PM_{10}, $PM_{2.5}$, SO_2, NO_2, NO, NOX as NO_2	Low (NO_2, SO_2, O_3, PM_{10}, $PM_{2.5}$)
Ballymena Ballykeel	$PM_{2.5}$, PM_{10}, NO_2, SO_2, NOX as NO_2, NO	Low ($PM_{2.5}$, PM_{10})
Armagh Lonsdale Road	PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2, PM_{10})
Newry Canal Street	PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2, PM_{10})
Downpatrick Roadside	NO_2, NO, NOX as NO_2	Low (NO_2)
Lisburn Dunmurry Seymour Hill	$PM_{2.5}$, PM_{10}, SO_2	Low (All)
Belfast Stockman's Lane	PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2, PM_{10})
Belfast Westlink Roden Street	NO_2, NOX as NO_2, NO	Low (NO_2)
Belfast Ormeau Road	NO_2, NOX as NO_2, NO	Low (NO_2)
Belfast Centre	$PM_{2.5}$, PM_{10}, SO_2, NO_2, O_3, CO, NOX as NO_2, NO	Low ($PM_{2.5}$, PM_{10}, SO_2)
Belfast Newtownards Road	NO_2, NOX as NO_2, NO	Low (NO_2)
Castlereagh Dundonald	NO_2, NOX as NO_2, NO	Low (NO_2)

[65] https://www.airqualityni.co.uk/

North Down Holywood A2	$PM_{2.5}$, PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2, PM_{10}, $PM_{2.5}$)
Newtownabbey Antrim Road	NO_2, NOX as NO_2, NO	Low (NO_2)
Ballymena Antrim Road	NO_2, NO, NOX as NO_2	Low (NO_2)
Strathfoyle Bawnmore Place	$PM_{2.5}$, PM_{10}	Low (All)
Newtownstewart	$PM_{2.5}$, PM_{10}	Low (All)
Lough Navar	$PM_{2.5}$, PM_{10}, O_3	Low (All)
Strabane Springhill Park	No Data	No Data
Limavady Dungiven	NO_2, NO, NOX as NO_2	No Data

* https://www.airqualityni.co.uk/ Accessed 17 April 2023

Air quality in Northern Ireland is reported annually by DAERA, the most recent report in 2021[66], and is compiled from data supplied by the monitoring stations. This highlights any exceedances of air quality objectives and highlights any emerging air quality trends. The most significant air pollutants for Northern Ireland and their sources are the following:

- Nitrogen oxides (NO_x, including nitric monoxide NO and nitrogen dioxide NO_2), arising from fuel combustion in transport and energy generation.
- Sulphur dioxide (SO_2), arising from combustion of fuels that contain sulphur, from power generation, industry and domestic solid fuel combustion.
- Particulate matter (PM_{10} and $PM_{2.5}$), arising from road transport and domestic solid fuel combustion, and as a secondary pollutant from ammonia.
- Ground-level ozone (O_3), arising from the interaction of various air pollutants with sunlight.
- Ammonia (NH_3), arising from agricultural activities and handling of manure. NH_3 reacts with other pollutants (NO_x, S), producing fine particles of ammonium nitrate and ammonium sulphate.
- Polycyclic aromatic hydrocarbons (PAHs), arising from incomplete combustion primarily from domestic sources.

The following pollutants were monitored in Northern Ireland during 2021: carbon monoxide (CO), oxides of nitrogen (NO_x), comprising nitric oxide (NO) and nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particles (as PM_{10}, $PM_{2.5}$ and black carbon), ozone (O_3), benzene, polluting elements (including lead, arsenic, cadmium, nickel, and mercury) and polycyclic aromatic hydrocarbons (PAHs). The Regulations limit values, target values and AQS objectives were met for the following pollutants in Northern Ireland in 2021: PM_{10} and $PM_{2.5}$ particulate matter, NO_2, O_3, CO, benzene, SO_2 and polluting elements. The three sites monitored for PAHs exceeded AQS objectives; these are likely due to solid fuel burning. This has potential to decrease, however, as Northern Ireland's new Energy Strategy - Path to Net Zero Energy[67], published in 2021, details restrictions on burning fossil fuels for home heating.

Local Air Quality Management (LAQM) provides the framework under the Environment Order (NI) 2002 within which air quality is managed by Northern Ireland's local authorities (District Councils). LAQM requires the District Councils to review and assess a range of air pollutants against the objectives set by the Air Quality Strategy (AQS), using a range of monitoring, modelling, and other methods. For locations where objectives are not expected to be met by the relevant target date, District Councils are required to declare an Air Quality Management Area (AQMA), and to develop an Action Plan to address the problem. There are 19 active AQMAs in Northern Ireland, set for one or more of the pollutants PM_{10}, NO_2, or SO_2; the locations of these AQMAs are shown in **Figure 3-9**.

[66] https://www.daera-ni.gov.uk/publications/air-pollution-northern-ireland-2021

[67] https://www.economy-ni.gov.uk/publications/energy-strategy-path-net-zero-energy

Figure 3-9 Air Quality Management Areas in Northern Ireland

The UK National Atmospheric Emission Inventory (NAEI) is the standard reference air emissions inventory for the UK, and includes emission estimates for England, Scotland, Wales and Northern Ireland for a wide range of important pollutants including GHGs, regional pollutants leading to acid deposition and photochemical pollution, persistent organic pollutants (POPs) and other toxic pollutants such as heavy metals. The NAEI is compiled annually, when the latest set of data are added, and the full time series updated and reported internationally. The latest report was published in October 2022 and covers the period 2005-2020[68]. This summarises emissions in Northern Ireland for the eight priority air pollutants: ammonia (NH_3), carbon monoxide (CO), nitrogen oxides (NO_x as NO_2), non-methane volatile organic compounds (NMVOCs), particulate matter less than 10 micrometres (PM_{10}), particulate matter less than 2.5 micrometres ($PM_{2.5}$), sulphur dioxide (SO_2) and lead (Pb). Most pollutant emission levels were lower in 2020 than they were in 2005. A switch in energy generation has created a reduction in sulphur dioxide (SO_2) levels in NI due to the development of a natural gas pipeline to Northern Ireland, this has allowed for fuel switching away from oil and coal-fired generation.

Construction and maintenance activities associated with the development of transmission infrastructure may lead to temporary, localised increases in air pollution, including ambient PM_{10} and nitrogen dioxide emissions. This has potential to lead to short-term secondary negative impacts on human health and biodiversity. Good air quality is essential for human health and wellbeing; air pollution generally, and particularly that arising from the transport sector, is recognised as a significant health burden in terms of illness and premature death. NO_2 belongs to a group of gaseous air pollutants that are produced by road traffic and other forms of fossil fuel combustion. This can be a lung irritant and can lower resistance to respiratory infections such as influenza; frequent or continuous exposure to high concentrations can result in increased incidence of acute respiratory

[68] https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2210251052_DA_Air_Pollutant_Inventories_2005-2020_FINAL_v1.2.pdf

illness in children[69]. PM_{10} originates from both natural and man-made sources; in urban locations the majority of particulate matter in the air originates from road transport and fossil fuel combustion. Fine particles can cause lung inflammation, and can exacerbate symptoms of heart and lung disease, as well as potentially transmitting carcinogenic compounds.

Nitrogen oxides contribute to nitrogen deposition through dry deposition, close to the pollutant source or through wet deposition of nitrogen compounds in rainfall, which can be transported much further than the source. The deposition of nitrogen compounds aids the growth of some plant species but can lead to significant negative effects on plant species that are adapted to low nitrogen concentrations. In designated sites, which protect sensitive and environmentally important habitats and species, the availability of excess nitrogen through deposition can lead to out-competition of sensitive species by those that are more nitrogen-tolerant, and subsequent changes in community composition, biodiversity loss and changes in the structure and function of the ecosystem. A search of the Air Pollution Information System (APIS)[70] indicates that, of the 58 SACs in Northern Ireland, 48 are receiving nitrogen deposition that is above the critical load for the designated habitat or species present.

3.3.5.2 Summary of Existing Pressures and Issues for Air in Northern Ireland

According to Northern Ireland's most recent state of the environment review (2013), air pollution from domestic combustion and from road transport remain as challenges in the improvement of air quality for the protection of human health[71], while pollutants can also lead to secondary effects on sensitive habitats. However, air quality has improved significantly over the past few decades, and the most recent air quality monitoring report shows that all pollutants, except for PAHs, met EU limit and target values and AQS objectives. Northern Ireland's new Energy Strategy - Path to Net Zero Energy is expected to support further improvements in air quality.

Implementation of the draft TDPNI, and the construction and maintenance activities associated with the potential transmission development projects therein, has the potential to lead to temporary, localised, increases in air pollution, including ambient PM_{10} and nitrogen dioxide emissions, resulting in short-term negative impacts upon air quality, climatic factors, human health and biodiversity. There is also potential for these projects to lead to localised disturbance impacts during construction or maintenance, through dust deposition and visible plumes, resulting from ground movement and influenced by the ambient weather conditions. However, implementation of the draft TDPNI also has potential to lead to positive effects on air quality in the medium and long-term, with the potential for connection of new renewable energy generators, such as wind and tidal turbines, to the national grid expected to support a reduced dependence on fossil fuels and a net reduction in the quantity of pollutants released into the atmosphere. This could have far-reaching positive consequences upon other factors such biodiversity, climate, and human health.

3.3.6 Climatic Factors

Climate change represents one of the most important threats to our environment, and to our economy, and projections indicate that hotter, drier summers and warmer wetter winters will occur over the next century because of climate change. The Paris agreement, signed in 2015, committed to strengthening the global response to the threats of climate change, by holding the global temperature rise to no more than 2°C and preferably below 1.5°C. Key to this agreement is the reduction of Greenhouse Gas (GHG) emissions fast enough to achieve this temperature goal.

The recent European Green Deal 2019 aims to make significant advances in climate action, providing a more sustainable low-carbon economy for the EU. It plans to boost the efficient use of resources by moving to a clean circular economy, and to restore biodiversity and cut pollution. The Deal has set a goal of net zero carbon emissions by 2050, and a 50-55% reduction in emissions by 2030. The UK Climate Change Act 2008 introduced a legally binding target for the reduction of GHG emissions in the UK by at least 80% below 1990 baseline levels by 2050. The target for the current 2018-2022 period is a reduction in emissions by 37% by

[69] https://www.daera-ni.gov.uk/publications/northern-ireland-environmental-statistics-report-2020

[70] Air Pollution Information System | Air Pollution Information System (apis.ac.uk)

[71] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

2020 and, for the next period (2025) to reduce emissions by 51%. The Act was amended in 2019, and now commits the UK to reducing emissions by 100% by 2050 from 1990 baseline levels (in line with the EU's 'net zero 2050 target'). The first climate change legislation was passed by the Northern Ireland Assembly in 2022; the Climate Change Act (Northern Ireland) 2022 sets out the legal framework for tackling climate change by reducing GHG emissions in Northern Ireland, with a net zero target by 2050 from baseline levels.

It is considered that the key issues associated with implementation of the draft TDPNI climatic factors comprise:

- Potential for effects on climate resilience (mitigation and adaptation), including extreme weather events.
- Potential for interaction with areas of climate change induced flood risk (fluvial, pluvial or coastal), or coastal erosion risk.
- Potential for effects on lands that are carbon sinks (e.g., peatland, forests).
- Potential effects on GHG emissions owing to new renewable energy connections.

3.3.6.1 Northern Ireland's Climate

Northern Ireland has a moderate climate, due to the effects of the Atlantic Ocean, with relatively mild winters and cool summers. There are localised differences in temperature, cloud and precipitation across the region, introduced by the indented shape of the coastline and the presence of high ground. The mean annual temperature at low altitudes in Northern Ireland varies from about 8.5 °C to 10.0 °C, with the higher values occurring around or near to the coasts. January and February are usually the coldest months, and July the warmest. Rainfall varies widely across Northern Ireland, with the wettest places being in the Sperrin, Antrim and Mourne Mountains, and the highest areas having average annual totals of about 1600mm. Higher averages occur in the more western counties of Fermanagh, Derry / Londonderry and Tyrone, while the driest places occur further east around Strangford Lough and close to the east coast, and near to the southern and eastern shores of Lough Neagh - where the annual totals are less than 800mm[72].

3.3.6.2 Climate Change and GHG Emissions in Northern Ireland

According to the UK Climate Change Risk Assessment, infrastructure in Northern Ireland is exposed to a range of climate hazards; flooding poses the greatest long-term risk to infrastructure from climate change, however there are growing risks from heat, water scarcity and slope instability caused by severe weather[73].

The UK Climate Change Projections (UKCP18)[74] anticipate a greater chance of hotter, drier summers and warmer, wetter winters with more extreme weather and rising sea levels. The high emission scenario for Northern Ireland shows that by:

- 2070 winters could be up to 3.9 °C warmer and summers could be up to 4.9°C hotter.
- 2070 winters could be 25% wetter and summers 38% drier.
- 2100 sea levels in Belfast could rise by up to 94cms.

These effects of climate change are likely to increase pluvial, fluvial and coastal flooding and will require future development to be adaptable or resilient to future climatic changes and associated impacts. Climate change could have considerable impacts on riparian and coastal developments from increases in flood risk, with sea level rise already being observed and wetter winters anticipated. These potential impacts could have serious consequences in Northern Ireland, where many of the main cities and towns are on the coast or on large rivers. This could also have significant consequences for transmission infrastructure that proposes to cross and/or run parallel to natural or artificial waterbodies. There is also the potential that transmission development areas could interact with areas of climate change influenced by coastal erosion. The Coastal Erosion Risk

[72] https://www.metoffice.gov.uk/climate/uk/regional-climates/ni#rainfall.

[73] https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Northern-Ireland-National-Summary.pdf

[74] https://www.daera-ni.gov.uk/articles/uk-climate-change-projections

Management Report[75] used available data to undertake a high-level assessment of the vulnerability of Northern Ireland's coastline to coastal erosion. This preliminary assessment did identify areas at potential risk of erosion, however, identified a lack of coastal erosion-specific data on which to base a reliable risk ranking.

The Northern Ireland GHG Inventory includes data on GHG emissions in Northern Ireland, forming part of the UK GHG Inventory reported at an international level in line with UK commitments under the Kyoto Protocol. The Inventory is updated annually, the latest available covers the period 1990-2020[76].

In 2020, Northern Ireland accounted for 5.2% of the UK total GHG emissions, which is higher than its population share of 2.8%. Since the base year (1990), Northern Ireland's total GHG emissions have decreased by 24% from 27.5 to 20.9 million tonnes of carbon dioxide equivalent ($MtCO_2e$), with a 4.2% decrease from 2019 to 2020, largely attributable to the transport sector which was impacted by travel restrictions imposed during the COVID-19 pandemic. Travel reduction was seen across all vehicle types, but particularly buses and passenger cars. Residential emissions also declined in this period, driven by fuel switching from coal to natural gas.

Agriculture was the sector responsible for the greatest amount of GHG emissions in 2020 (26.6%), followed by transport (16.2%), residential (13.7%), energy supply (13.6%) and business (13.4%) sectors. The energy supply sector experienced a fall in emissions of 2.5MtCO2e from 2019 to 2020 (2.5% decrease), due mainly to fuel switching from coal and oil to natural gas. Since the base year, there has been a 46.4% decrease in emissions from this sector.

The composition of GHG emissions for Northern Ireland in 2020 was as follows:

- 68% Carbon dioxide (UK 79%)
- 23% Methane (UK 13%)
- 8% Nitrous oxide (UK 5%)
- 1% Fluorinated and other gases (UK 3%)

Across all sectors other than agriculture and waste management, carbon dioxide was the most common emitted GHG. Within the energy supply sector, CO_2 comprised the total amount of GHG emissions.

The energy supply sector is currently responsible for 13.6% of GHG emissions in Northern Ireland, comprised entirely of CO_2. Energy-related sectors (business, energy supply, industrial process, public, residential and transport) together account for almost 60% of Northern Ireland's GHG emissions and, to target changes in the overall energy sector, an Energy Strategy for Northern Ireland – Path to Net Zero Energy was published in 2021[77]. The primary targets of this strategy are:

1. Energy Efficiency: Deliver energy savings of 25% from buildings and industry by 2030.
2. Renewables: Meet at least 70% of electricity consumption from a diverse mix of renewable sources by 2030
3. Green Economy: Double the size of our low carbon and renewable energy economy to a turnover of more than £2 billion by 2030.

GHG emissions are an indicator in the draft 2016-2021 PfG, based on a criteria for change set at +/ 1.0 percentage points annually since the baseline of 21.9 $MtCO_2e$ in 2014. The decrease of 7.7% from 2014 to 2020 is considered as 'no change' for PfG reporting. On the whole, the UK has reduced emissions by nearly 50% since the base year, however the different parts of the UK vary in their reduction, with Northern Ireland achieving the lowest reduction of 24% in emissions to date (Scotland 51%; England 53%; Wales 40%).

[75] https://niopa.qub.ac.uk/bitstream/NIOPA/11088/1/coastal-erosion-risk-management-report-2019.pdf

[76] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NI%20Greenhouse%20Gas%20Statistics%201990-2020%20Report%20FINAL-revised.pdf

[77] https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Energy-Strategy-for-Northern-Ireland-path-to-net-zero.pdf

3.3.6.3 Summary of Existing Pressures and Issues for Climatic Factors in Northern Ireland

Climate change represents a significant challenge internationally. GHG emissions in Northern Ireland have decreased by 24% since 1990, owing to improvements in energy efficiency, switching from coal to natural gas as a fuel source, and improvements in the management of landfills. The energy supply sector has lower emissions of GHGs currently than it had in 1990. The UK has committed to a target of a 37% reduction in GHGs by 2020 and, through the Climate Change Act (Northern Ireland) 2022, Northern Ireland has committed to a target of 100% reduction by 2050; although in 2020 the UK as a whole had a 49.9% reduction, in Northern Ireland GHG reduction stood at only 23.9%. This has implications for successfully contributing to the UK and Northern Ireland targets for 'net zero emissions' by 2050.

Activities associated with the development of transmission infrastructure, including manufacturing, transportation, construction, maintenance and decommissioning, may lead to increased emission of pollutants into the atmosphere, and contribute towards anthropogenic climate change. However, the government, in its Energy Strategy, has set a green energy target for at least 70% of electricity consumption from renewable sources by 2030. Progress has been made towards this target; the most recent figures[78] showing that 49.3% of electricity consumption came from indigenous renewable sources for the 12-month period October 2021 to September 2022, an increase of 7.2% from the previous 12-month period. Of all renewable energy generated within Northern Ireland in this period, 84.9% was generated from wind. Continued progress in this way, through the ongoing connection of renewable energy generators to the national grid, is likely to result in a reduced dependency upon fossil fuels, a net reduction in the emission of pollutants into the atmosphere, and support climate change mitigation. The draft TDPNI should aim to advance these targets.

3.3.7 Material Assets

The term 'Material Assets' can be considered very broadly within the SEA process, encompassing for example infrastructure, settlements, transport and utilities.

Given the geographic scope of the TDPNI and the large-scale nature of proposed alternatives, there is potential for transmission infrastructure development and operation to impact upon, or be impacted by, existing material assets. It is considered that the key issues associated with implementation of the draft TDPNI and material assets comprise:

- Potential for effects on transport infrastructure.
- Potential for effects on energy infrastructure.
- Potential for effects on agricultural lands.

3.3.7.1 Transport Infrastructure and Assets in Northern Ireland

The road network of Northern Ireland intersects both urban and rural areas in the form of motorways, A roads, B roads and local roads; together these comprise approximately 25,700km of public road[79]. Approximately 9,700 km of footways, 5,800 bridges and 290,000 streetlights[80] are associated with this network of roads. Northern Ireland also has six railway routes, which together cover a distance of 329,855km; with the exception of the Portrush-Coleraine line, these all serve the city of Belfast along their route. Air travel infrastructure includes three main commercial airports: Belfast International Airport, City of Derry Airport and George Best Belfast City Airport. There are also 23 small commercial, private and military airfields throughout Northern Ireland, including St Angelo Airport in Enniskillen and Newtownards Airport. The main transport infrastructure in Northern Ireland is shown in **Figure 3-10**.

[78] https://www.economy-ni.gov.uk/news/electricity-consumption-and-renewable-generation-northern-ireland-year-ending-september-2022#:~:text=In%20terms%20of%20the%20volume,sources%20located%20in%20Northern%20Ireland.

[79] https://www.infrastructure-ni.gov.uk/news/northern-ireland-transport-statistics-2019-2020-statistical-report-has-been-published-today

[80] https://www.infrastructure-ni.gov.uk/transportni-overview-0#:~:text=DfI%20Roads%20is%20responsible%20for,and%20367%20public%20car%20parks.

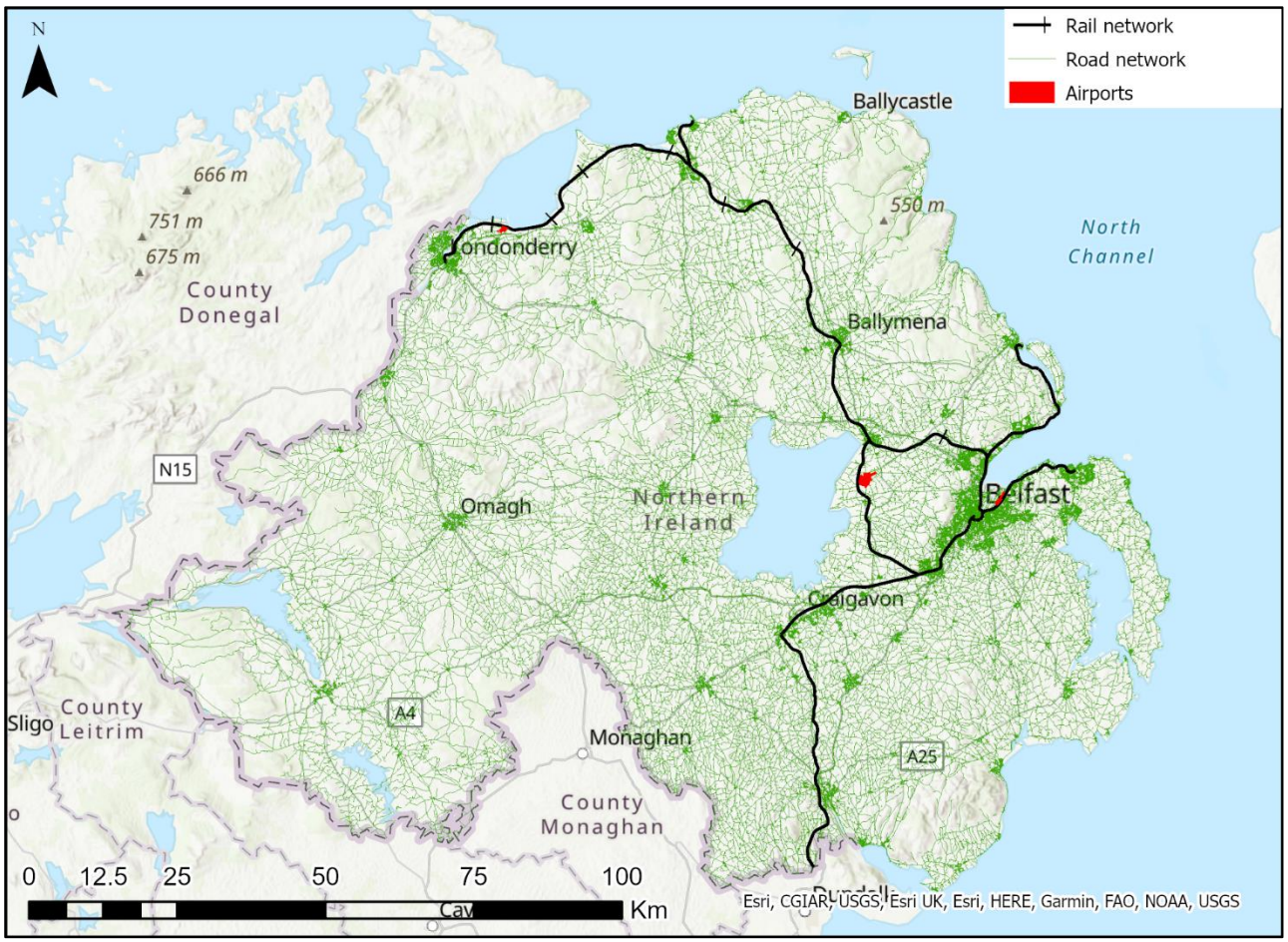


Figure 3-10 Main transport infrastructure within Northern Ireland

3.3.7.2 Energy Infrastructure and Assets in Northern Ireland

Northern Ireland Electricity Networks (NIE Networks) owns the electricity transmission and distribution networks in Northern Ireland. The existing electricity transmission infrastructure in Northern Ireland comprises 2,300km of transmission network, and includes 713km of 275 kV overhead line and 1km of cable, 934km of 110kV overhead line, 112km of 110 kV cable and 8,427 substations. The distribution infrastructure includes 47,000km of distribution network, and serves over 910,000 customers including homes, businesses and farms. Northern Ireland has three fossil fuel generating plants, located at Ballylumford, Kilroot and Coolkeeragh, which sell electricity into the Single Electricity Market pool along with other generators, including renewable energy. Electricity is also supplied to this pool by Mutual Energy Limited via the Moyle interconnector.

There are four gas transmission pipelines within Northern Ireland. These are:

- South North Pipeline (SNP), owned by BGE NI. This pipeline is 156km long and runs from Co. Antrim to Gormanstown in Co. Meath, where it links into the NWP.
- North West Pipeline (NWP), owned by BGE NI. This pipeline is 112km long and runs from Carrickfergus to Coolkeeragh Power Station.
- Scotland to Northern Ireland Pipeline (SNIP), owned by Premier Transmission Limited. This pipeline is 135km long and runs from Twynholm in Scotland to Ballylumford.
- Belfast Gas Transmission Pipeline (BGTP), owned by Belfast Gas Transmission Limited. This pipeline is 26km long and is connected to the SNIP and the NWP, while also supplying gas to the Belfast distribution network.

Gas distribution conveys gas to licenced areas within Northern Ireland through medium and low pressure gas mains. There are three distribution licenced areas within Northern Ireland: the Greater Belfast and Larne distribution licenced area, operated by Phoenix Natural Gas Limited; the Ten Towns distribution licenced area,

operated by Firmus Energy (Distribution) Limited; and the West distribution licenced area, operated by SGN Natural Gas Limited.

The main existing energy infrastructure in Northern Ireland is shown in **Figure 3-11**.

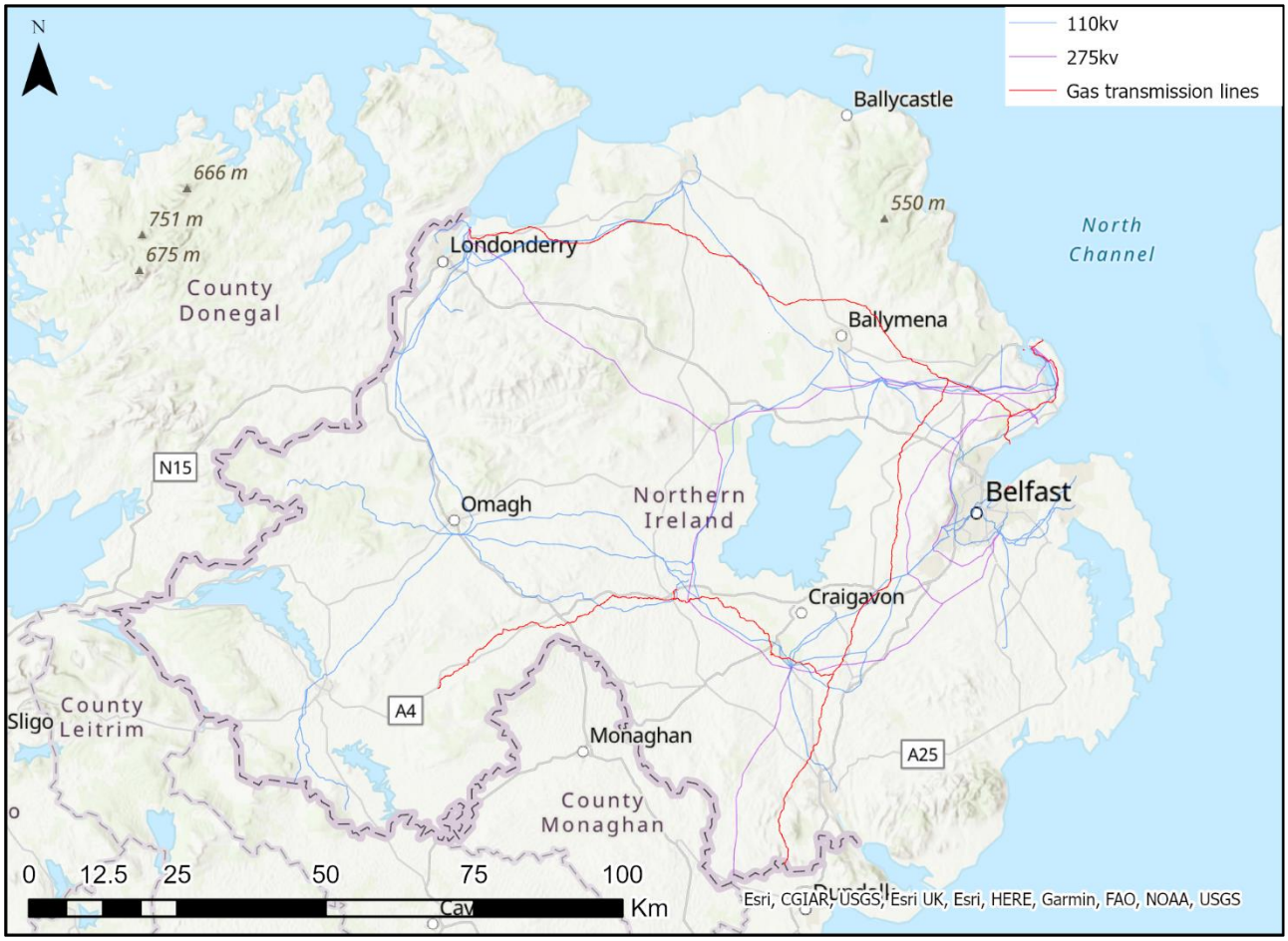


Figure 3-11 Main energy infrastructure within Northern Ireland

3.3.7.3 Summary of Existing Pressures and Issues for Material Assets in Northern Ireland

Population growth and development are placing increasing pressure on many infrastructure assets, such as water treatment and supply and wastewater treatment, particularly in urban areas. Annual population growth has been positive for the past 25 years in Northern Ireland, and the total population is predicted to increase from approximately 1.9 million in 2021 to approximately 1.99 million by 2043. Population growth is likely to increase the demand for infrastructure and the consumption of energy.

Implementation of the draft TDPNI, and the proposed transmission infrastructure projects therein, has the potential to lead to short-term temporary disruption to material assets, including existing electricity infrastructure (and thus power supply) during the construction phase. There is also potential for short-term negative impacts on transport infrastructure (roads and rail) resulting from power-supply disruptions and increased construction related traffic. In addition, as discussed in Section 4.3.3, land use across Northern Ireland is dominated by agricultural use (comprising >74%), and most transmission infrastructure is routed across / located within agricultural lands. There is therefore also potential for short-term disruption to agricultural land use activities in the vicinity of works.

3.3.8 Cultural, Architectural and Archaeological Heritage

Cultural heritage, including archaeological heritage and architectural heritage, are places and objects of beauty, cultural, historic, scientific, social or spiritual value. They include archaeological monuments, world heritage sites, protected structures, designed landscapes, place names, language and inherited traditions.

Northern Ireland is rich in cultural, archaeological and architectural heritage, with many important archaeological sites, monuments and heritage buildings.

It is considered that the key issues associated with implementation of the draft TDPNI and Cultural, Architectural and Archaeological Heritage comprise:

- Potential for effects on areas of designated landscape quality and scenic views (i.e., in Local Area Plans).
- Potential for effects on the general landscape (including riverscapes, lakescapes and seascapes) and its sensitivity to development.

3.3.8.1 Heritage Assets

There are 51,820 recorded heritage assets within Northern Ireland that have been included in the Historic Environment Record of Northern Ireland (HERoNI). This includes:

- 17,855 entries on the Sites and Monuments Record.
- 15,383 recorded historic buildings.
- 15,704 Industrial Heritage Record sites.
- 738 Defence Heritage Record sites.
- 738 Battlefield sites.
- 663 Historic Parks and Gardens Record sites.
- 340 Historic Wrecks.
- 399 Historic Nucleated Urban Settlements (including those with identified areas of archaeological potential).

There are also over 12,000 designated heritage assets in Northern Ireland. This includes:

- 190 Monuments in State Care.
- 2,014 Scheduled Historic Monuments.
- 2 Protected Wrecks.
- 8,976 Listed Buildings (Listed Buildings are those designated through listing as being of 'special architectural or historic interest' under Section 80 of the Planning Act (NI) 2011).
- 300 Historic Parks and Gardens of Special Historic Interest (A Register of Parks, Gardens and Demesnes of Special Historic Interest was established in the late 1990s to identify those sites that can be considered of exceptional importance within Northern Ireland).
- 58 Conservation Areas.

Historic Parks, Gardens and Demesnes form part of the HERoNI, and are identified on the basis of these records for protection in the Local Development Plan (LDP) process. Local Landscape Policy Areas (547 no.), Areas of Significant Archaeological Interest (10 no., representing distinctive areas of the historic landscape in Northern Ireland), and Areas of Townscape / Village Character (177 no.) are LDP designations which may include assets recorded by HERoNI.

There is also one UNESCO world heritage site in Northern Ireland; being the Giant's Causeway, designated for its unique geological heritage.

It is important to note that The HERoNI archive is still growing, with new assets added as new information is provided.

An evidence-based study has been completed to determine the actual effects of the construction, presence and operation of high voltage transmission projects including overhead lines, underground cables, and

substations, on archaeological, architectural and cultural heritage, in the Republic of Ireland[81]. A comprehensive review of available monitoring and excavation reports for transmission projects (overhead lines and infrastructure) from the previous 40 years was undertaken as part of this study. This review indicated that identified impacts on cultural heritage from the construction of overhead lines is generally small in scale, owing to the limited excavation required for the construction of poles or pylons, and that these heritage sites should therefore be easily avoidable. Greater potential was found for projects involving underground cabling to interact with cultural heritage features, particularly archaeological sites, owing to the requirement for excavation of a long, linear trench. Records from projects involving substation development indicated that these did not reveal large-scale archaeological sites; although this could be expected to occur due to the relatively large scale of these sites, these projects involved initial site studies that would enable the avoidance of sensitive areas. Field studies were undertaken of sections or sites of existing power lines, cables and substations. At approximately one third of these sites, no threat was found to any cultural heritage features, while at the remaining sites minor to moderate threats were found to the wider site setting. In a few instances, projects were found to have had a significant impact on existing archaeology.

3.3.8.2 Summary of Existing Pressures and Issues for Cultural Heritage in Northern Ireland

Built heritage in Northern Ireland has been adversely affected by population growth and expansion of the agricultural sector since the 18th century, with major landscape changes such as marginal land reclamation and removal of peatland occurring since the UK joined the EU in the 1970s[82]. According to the most recent State of the Environment report for Northern Ireland (2013), the archaeological resource is at risk from agricultural land use practices, and from urban development. While archaeology and built heritage in urban areas tends to be most susceptible to impacts associated with development, resources in rural areas are susceptible to impacts associated with agriculture, particularly through cultivation, but also through stock density and machinery use. At present, 527 heritage assets, including 5.4% of listed buildings, are on the Heritage at Risk register, while 3% of Scheduled Historic Monuments are considered to be in poor condition[83]. Environmental protection policies since the 1980s have brought protection to known archaeological sites and have incentivised good management practices, however protected and unprotected sites are considered to remain at risk from arable practices and urban development.

The construction of proposed transmission infrastructure projects such as overhead lines, has some potential for direct impacts on cultural heritage features e.g., through excavation for the construction of poles or pylons, however known heritage sites should be avoidable during route planning. Factors such as good routing practices, well designed EIA processes, greater statutory protection and better engagement with regulatory authorities should enable the avoidance of significant impacts on heritage features that have resulted from past transmission infrastructure developments[84]. However, the potential for indirect effects on these sites remains, such as effects on the setting of features, and the impact of crossing sensitive cultural landscapes, and should be minimised through the application of best practice. Certain cultural heritage features have the potential to be transboundary in nature, such as earthworks and canals; there may be potential for direct effects on these features within the Republic of Ireland, as well as indirect effects on the setting of features This should be taken into account for any projects that are planned in proximity to the border with the Republic of Ireland.

3.3.9 Landscape and Visual Amenity

‘Landscape’ is defined by the European Landscape Convention as ‘‘an area as perceived by people whose character is the result of the action and interaction of natural and/or human factors’ and ‘it concerns landscapes that might be considered outstanding as well as everyday or degraded landscapes’. It aims to promote landscape protection, management and planning, and to organise European co-operation on landscape

[81] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 2: Cultural Heritage. Literature review and evidence based field study on the effects of high voltage electricity infrastructure on archaeological, architectural and cultural heritage in Ireland.

[82] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

[83] NI Heritage Statistics (communities-ni.gov.uk)

[84] EirGrid Evidence Based Environmental Studies Study 2 Cultural Heritage. (November 2015).

issues. The UK ratified the Convention in 2006, and it came into effect in 2007. Signatories to the Convention are required to draw up specific and/or sectoral landscape strategies, linked by landscape quality objectives.

The current landscape of Northern Ireland is a product of land use changes and human interventions that have taken place in the *c*.9, 000 years since the area was first settled. Although population growth in the late 20th and early 21st centuries expanded the extent of built-up areas, the Northern Ireland landscape remains predominantly rural, with agriculture the most prevailing land use[85].

It is considered that the key issues associated with implementation of the draft TDPNI and Landscape and Visual Amenity comprise:

- Potential for effects on areas of designated landscape quality and scenic views (i.e., in Local Area Plans).
- Potential for effects on the general landscape (including riverscapes, lakescapes and seascapes) and its sensitivity to development.

3.3.9.1 Designated Landscapes

The value of the landscape present in Northern Ireland is recognised through the designation of eight Areas of Outstanding Natural Beauty (AONB), designated for their distinctive landscape character and high scenic value, as follows:

- Strangford and Lecale AONB
- Antrim Coast and Glens AONB
- Causeway Coast AONB
- Ring of Gullion AONB
- Lagan Valley AONB
- Mourne AONB
- Binevenagh AONB
- Sperrin AONB

These areas cover approximately 325,000 hectares, or *c*.20% of the total land area of Northern Ireland.

As described in Section 4.3.8, the Giant's Causeway UNESCO WHS is designated for its unique geological heritage. The Cuilcagh Lakelands UNESCO Global Geopark, formerly Marble Arch Caves UNESCO Global Geopark, is a transnational geopark that straddles the border between Fermanagh in Northern Ireland and Cavan in the Republic of Ireland, while the Mourne, Gullion, Strangford UNESCO Global Geopark is situated along the south-east border of Northern Ireland; these Geoparks are areas of internationally important rocks and landscapes, all of which must be managed responsibly for conservation, education, and sustainable development. The location of AONBs, WHS and Global Geoparks within the study area is shown in **Figure 3-12**.

[85] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

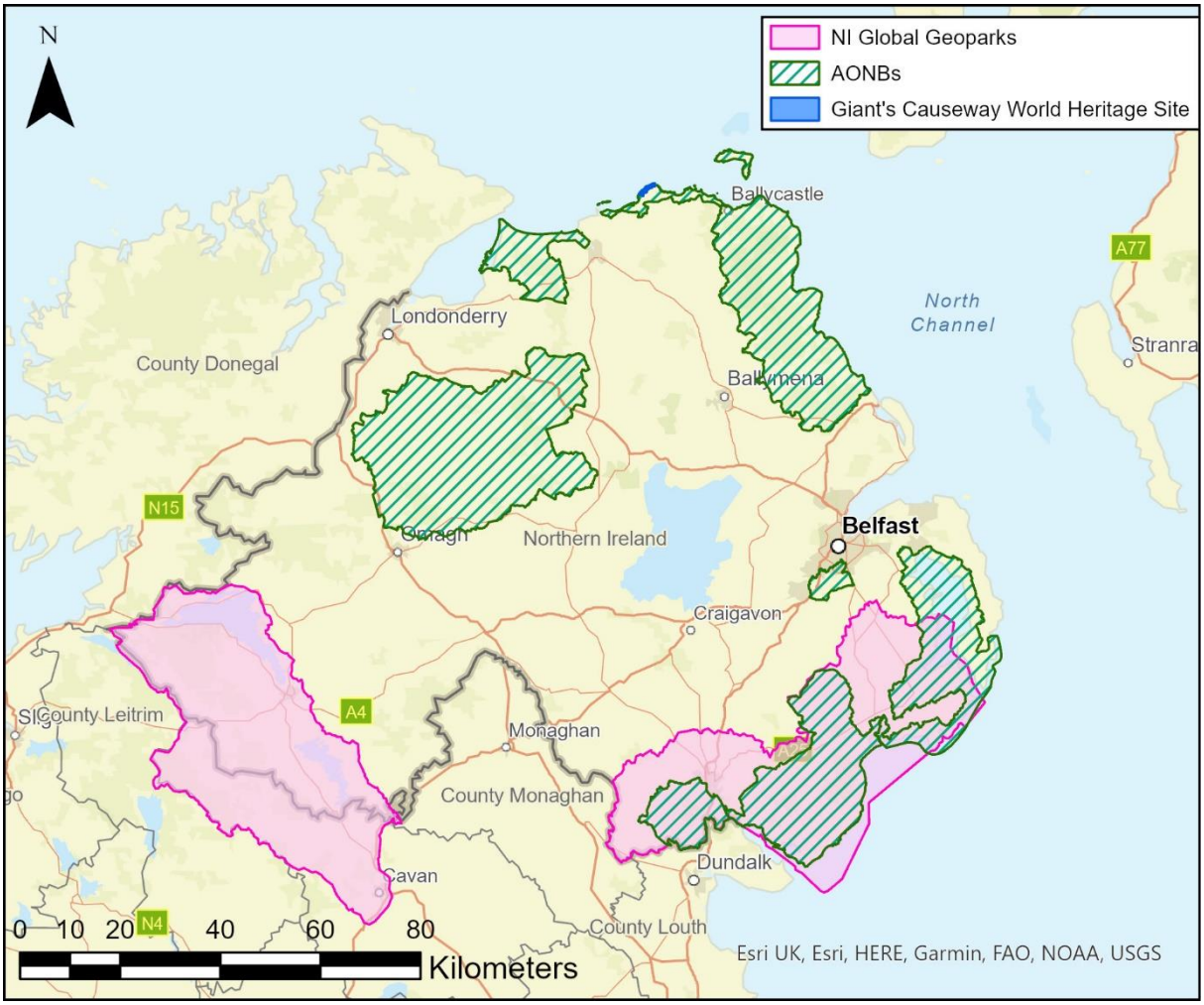


Figure 3-12 Location of AONBs, WHS and Global Geoparks within Northern Ireland

There are also eight NIEA Country Parks, as well as 56 National Trust Sites within Northern Ireland, the latter of which include Rathlin Island Slieve Donard and Castle Coole. In addition, the Northern Ireland Landscape Character Assessment 2000, described below, identified special landscapes that it termed Areas of Scenic Quality; some of these areas have been included in Local Area Plans, where they may be designated as Areas of High Scenic Value (AoHSV).

'Shared Horizons'[86] is DAERA's Statement of Policy on Protected Landscapes. This Statement sets out the issues associated with the protection and sustainable use of Northern Ireland's finest landscapes, usually recognised by some form of designation that sets them apart from the wider countryside and indicates the way in which DAERA plans to address them.

3.3.9.2 Landscape and Seascape Character Assessment

Landscape character assessments are used as a tool to identify the landscape features that give a locality its 'sense of place'. The use of landscape character assessments for this purpose arose in response to the European Landscape Convention of 2000. The Nature Conservation and Amenity Lands Order (NI) 1985 (NALCO) is the current legislative basis for the protection of landscapes. A Landscape Character Assessment of the whole territory of Northern Ireland was carried out in 1999, before the European Landscape Convention was published and became binding. The Northern Ireland Landscape Character Assessment 2000[87] (NILCA)

[86] https://www.daera-ni.gov.uk/articles/shared-horizons

[87] https://www.daera-ni.gov.uk/articles/landscape-character-northern-ireland

subdivided the countryside into 130 Landscape Character Areas (LCAs), each based upon local patterns of geology, landform, landuse, cultural and ecological features. For each LCA, the key characteristics were described and an analysis of landscape condition and its sensitivity to change was made. The land use planning system will generally refer to the NILCA where development might affect the landscape character[88].

The Northern Ireland Regional Landscape Character Assessment (NIRLCA), developed in 2016, aimed to complement the NILCA by providing a regional framework upon which more detailed local studies could be based. This subdivided the countryside into 26 Regional Character Areas (RCAs), based upon information relating to people and place and the combinations of nature, culture and perception that contribute to local uniqueness. These aim to provide information on which to base plans at a more local level that might affect landscape character. In addition, the Northern Ireland Regional Seascape Character Assessment[89] identified 24 Regional Seascape Character Areas (RSCAs) along the Northern Ireland coast, describing the key features and characteristics of each area, and relating these to neighbouring terrestrial LCAs. These are: Foyle Estuary RSCA, Lough Foyle RSCA, North Coast Strands and Dunes RSCA, The Skerries and Dunluce Coast RSCA, Causeway Coast RSCA, Ballycastle Coast RSCA, Rathlin RSCA, Torrr Head RSCA, Northern Glens Coast RSCA, Southern Glens Coast RSCA, The Gobbins RSCA, Larne Lough RSCA, Belfast Lough RSCA, Belfast Harbour RSCA, Ards Peninsula RSCA, Strangford Lough RSCA, Lecale Coast RSCA, Dundrum Bay RSCA, Mourne Coast RSCA, Carlingford Lough RSCA, Newry Estuary RSCA, Atlantic RSCA, North Channel RSCA, and Irish Sea (South Down) RSCA. These SCAs were identified as distinct areas with a unique sense of place, with boundaries tending to represent indicative lines of gentle transition rather than an abrupt change in seascape character.

The NIEA also published Northern Ireland's Landscape Charter in 2014 in response to the European Landscape Convention, with the following affirmations and guiding principles for decision making: landscape is essential; landscape contributes to wellbeing; landscape is part of identity; landscape reflects culture; landscapes matter and each of us has a right to landscape benefit; landscapes are shared and each of us is responsible; landscape is a networked asset whose whole is more than the sum of its parts; landscape change is inevitable but can be managed to enhance value; and transparency engenders awareness and confidence. Those interested in the value of Northern Ireland's landscape can sign the charter, thereby committing to these affirmations and guiding principles through their actions.

The NIEA has undertaken an assessment of the sensitivity of Northern Ireland's LCAs to windfarm development (NIEA, 2010[90]), which is expected to be largely comparable to its sensitivity to transmission infrastructure development. This describes the sensitivity of LCAs to wind energy development, taking into account the different landscape components and attributes that influence sensitivity to wind energy developments. Landscape sensitivity to wind energy development was considered as the extent to which the inherent character and visual amenity of a landscape are vulnerable to change due to this development, primarily a function of landscape character sensitivity (i.e., the degree to which a LCA is vulnerable to change which will affect its character); and visual sensitivity (i.e., the degree to which a particular view or visual landscape experience is vulnerable to change). Landscape value, through designation or local recognition of importance was also considered.

An evidence-based study was undertaken on the actual visual and landscape effect of the presence of high voltage transmission infrastructure over a range of typical landscapes in Ireland[91]. A literature review found no studies which confirmed that existing features and conditions (e.g., low elevation, clear sky, vegetation, etc.) influence the landscape and visual impact of transmission infrastructure. As part of this study, a field study aimed to determine how landscape character affects the impact of transmission infrastructure, and how this impact changes over distance. Significant impacts were found upon a wide range of landscapes throughout Northern Ireland; including rural lowland and upland areas, particularly within 400m of both tower and

[88] http://www.niassembly.gov.uk/globalassets/documents/raise/knowledge_exchange/briefing_papers/series4/kess_es_policybriefing_landscape-planning-for-sustainable-development-.pdf

[89] https://www.daera-ni.gov.uk/publications/northern-ireland-regional-seascape-character-assessment

[90] Northern Ireland Environment Agency (2010), Wind Energy Development in Northern Ireland's Landscapes: Supplementary Planning Guidance to accompany Planning Policy Statement 18 'Renewable Energy'. NIEA Research and Development Series No 10/01, Belfast.

[91] RPS Group 2014. EirGrid Evidence Based Environmental Studies Study 10: Landscape and Visual. Literature review and evidence based study on the landscape and visual effects of high voltage electricity infrastructure in Ireland.

substation developments, while the distance for potentially significant effects was found to be higher for upland areas than for rural lowland areas. The study found that visual perception is determined by design, distance from the viewer, setting (i.e., hills, skyline), and visibility, as well as by the opinion of the viewer. Screening, such as from trees and hedgerows, was found to help reduce the impact of 110kV towers, while 'backclothing' (routing the towers against a background such as higher land) was found to help reduce the impact of 220kV and 400kV towers.

3.3.9.3 Summary of Existing Pressures and Issues for Landscape and Visual Amenity in Northern Ireland

The main pressures on Landscape in Northern Ireland, according to the most recent State of the Environment report (2013), are development (including housing, industrial and recreational), infrastructure, extraction industries, agriculture and forestry, and tourism. Land cover and habitats have changed in the past few decades as a result of population increases, changes in household structure and employment patterns and agricultural restructuring. While the economic recession slowed the rate of developments for a period post-2008, actions to stimulate economic growth put continued pressure on urban and rural landscapes[92].

Implementation of the draft TDPNI and proposed transmission infrastructure projects therein, has potential to lead to negative effects on local landscape character or visual quality alone, or in combination with, existing pressures. There is potential for direct or indirect effects on the general landscape, as well as on areas designated for landscape quality and scenic views. The landscape around AONBs and WHS performs an important function by providing context, particularly in views to and from site. Effects on the landscape have the potential to be transboundary in nature where projects are developed in proximity to the border with the Republic of Ireland; the potential for direct or indirect effects on designated landscape areas as well as on the general landscape should be taken into account, where relevant.

3.4 Evolution of the Environment in the Absence of the draft TDPNI

In the absence of the draft TDPNI 2023-2032, i.e., the Do-Nothing Scenario, there would be no overarching strategic planning of transmission infrastructure, and therefore the construction and maintenance of transmission infrastructure will take place in a more ad hoc manner. There is likely to be less transmission development and maintenance under the Do-Nothing scenario. The projects that go ahead may not strategically be the best projects to be pursued and may not be the most sustainable.

In the absence of the Plan there are unlikely to be any short-, medium- or long-term changes to biodiversity, flora or fauna in Northern Ireland, such as increased risk to or loss of species or habitat. Biodiversity, flora and fauna will continue to be impacted upon by developments, human activity and population growth; however, this will not be the result of the absence of the Plan.

In absence of the Plan, construction and maintenance works to the electricity transmission infrastructure in Northern Ireland will be less structured and this may lead to negative impacts on population and human health. With projected population growth, in the medium- and long-term this approach may result in an unreliable supply of electricity in some areas due to lack of planning and insufficient development of infrastructure. Disruptions of supply could result in detrimental impacts upon the delivery of essential services which in turn could have economic and social consequences. In absence of the Plan there is also the potential for an ongoing reliance upon fossil fuels due to a lack of collaborative energy planning, reducing the potential for connection of renewable energy sources to the supply network. In the medium- and long-term this is likely to result in ongoing detrimental impacts on human health, which will worsen going forward from the medium- to the long-term.

There are unlikely to be any short-, medium- or long-term changes to geology, soils or land use within Northern Ireland in the absence of the Plan. There may be pockets of improvement of soil and land for agricultural purposes and therefore loss of more natural land, and also the loss of natural and agricultural lands to urban creep; however, these would not be due to the absence of the Plan.

[92] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-second-assessment-of-state-of-ni-environment-2013.pdf

There are unlikely to be any short-, medium- or long-term changes to the water environment in absence of the Plan. There are unlikely to be any short-, medium- or long-term changes to flood risk in Northern Ireland due to of absence of the Plan, which is likely to increase to increase as a result of rising sea-levels and wetter conditions brought about by climate change.

In the absence of the Plan, there is potential for medium- and long-term detrimental impacts upon air quality within Northern Ireland, as an ad hoc approach may result in less potential for connection of renewable energy sources to the electricity supply network. This is likely to result in the continued reliance upon finite fossil fuels and thus the ongoing, long-term emission of pollutants into the atmosphere. With population growth and therefore increased electricity demand expected into the future the severity of these impacts is likely to increase with time, in the absence of the Plan.

As a result of greenhouse gas emissions, climate change is predicted to occur; resulting in, inter alia, sea level rise, changes in rainfall patterns and temperatures, and changes in the frequency of droughts and extreme weather events. In the absence of the Plan the population of Northern Ireland is likely to continue to rely upon finite fossil fuels to provide its electricity as a lack of structured development may hinder the potential for connection of renewable sources to the electricity network. As a consequence of this the contributions towards the emission of anthropogenic greenhouse gas emissions will be ongoing, thus resulting in the potential further acceleration of climate change and the exacerbation of the impacts of climate change.

In the absence of the Plan there is potential for electricity supply shortages in parts of Northern Ireland. A lack of strategic and collaborative planning of the future electricity transmission network may leave some areas unable to meet increased demand resulting from economic and population growth. There is also potential for secondary impacts on other material assets such as rail and road, and also gas and water supply networks by way of disruption to services. These impacts have the potential to worsen going forward from the medium- to the long-term if demand continues to surpass supply in some underdeveloped areas.

Cultural, architectural and archaeological heritage features are unlikely to be significantly impacted upon as a result of the absence of the Plan. However, development of transmission infrastructure in an ad hoc manner, and thus in the absence of strategic-level planning, is more likely to have potential for impacts on cultural, architectural and archaeological features. In the absence of the Plan, the landscape value of Northern Ireland is unlikely to change significantly. There is potential for loss of landscape value outside of designated areas as a result of human activity and development, though this would not be the result of the absence of the Plan.

4 REVIEW OF RELEVANT PLANS, PROGRAMMES AND POLICIES

4.1 Interaction with other relevant Plans and Programmes

As part of the SEA process, the context of the draft TDPNI must be established with regard to other Plans and Programmes that have been adopted at International, National and Regional levels. In particular, the environmental protection objectives (EPO's) and standards included within these Plans and Programmes that will directly influence, or be influenced by, the draft TDPNI requires consideration. These EPOs have been used to create the Strategic Environmental Objectives (SEOs) that have been used for assessment of the draft TDPNI.

Table 4-1 identifies the main significant environmental plans, programmes and legislation, adopted at International / European level, National / Regional level or Sub-Regional level, which would be expected to influence, or be influenced by, the draft TDPNI. While it is recognised that there are many Plans, Programmes and legislation that could relate to the TDPNI it is considered appropriate to only deal with those significant texts in order keep the assessment at a strategic level. More information on these Plans, Programmes and legislation, along with their potential interaction with the draft TDPNI is given in **Appendix B**.

Table 4-1 Summary of Key Plans, Programmes and Legislation Relevant to the draft TDPNI 2023-2032

Level	Plan / Programme / Policy / Legislation
International / EU Level	*Biodiversity* • UN Convention on Biological Diversity (1992) • Ramsar Convention on Wetlands of International Importance (1971 and amendments) • Bern Convention (Convention on European Wildlife and Natural Habitats) (1982) • The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) (1992) • Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) (1983) • EU Biodiversity Strategy to 2030 • EU Birds Directive (Directive on the conservation of wild birds) [2009/147/EC] • EU Habitats Directive (Directive on the conservation of natural habitats and of wild fauna and flora) [92/43/EEC] • Convention for the Conservation of Salmon in the North Atlantic • North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019 – 2024 *Population / Human Health* • Seveso III Directive [2012/18/EU] • INTERREG Peace Plus Programme *Climate Change* • Paris Agreement (UNFCCC, 2015) • UN Kyoto Protocol, The United Nations Framework Convention on Climate Change (UNFCC, 1997) • EU 20-20-20 Climate and Energy Package Agreement (2007) • The European Green Deal 2019 • Renewable Energy Directive [2009/28/EC] • EU Strategy on Adaptation to Climate Change 2013 • Forging a climate-resilient Europe – the new EU Strategy on Adaptation to Climate Change 2021[COM(2021)82] • Second European Climate Change Programme (ECCP II) 2005 • EU Green Infrastructure Strategy (COM(2013) 249 final) *Air quality*

Level	Plan / Programme / Policy / Legislation
	• Stockholm Convention (2004) • WHO Air Quality Guidelines – global update (2005) • The Gothenburg Protocol (1999) • Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive [2008/50/EC] & 4th Daughter Directive of the Air Quality Framework Directive [2004/107/EC] • Industrial Emissions Directive [2010/75/EU] • National Emissions reduction Commitments (NEC) Directive [2016/2284/EU] • Geneva Convention (1979) *Sustainable Development* • Eight Environmental Action Programme (2021-2030) of the European Community • EUROPE 2020 A strategy for smart, sustainable and inclusive growth (COM/2010/2020) • Roadmap to a Resource Efficient Europe (COM(2011) 571) • SEA Directive [2001/42/EC] • EIA Directive [85/337/EEC] [2014/52/EU] • Energy Efficiency Directive [2012/27/EU] • EU Thematic Strategy for Soil Protection [COM/2006/231] and Report on its implementation [COM/2012/046] • Integrated Pollution Prevention Control Directive [96/61/EC], as amended by Directive 2008/1/EC • UN 2030 Agenda for Sustainable Development • REPowerEU 2022 *Water* • Water Framework Directive [2000/60/EC] and amendments • Marine Strategy Framework Directive [2008/56/EC] • Floods Directive [2007/60/EC] • Bathing Water Directive [2006/7/EC] • Groundwater Directive [80/68/EEC] and Daughter Directive [2006/118/EC] • Drinking Water Directive [98/83/EC] • Environmental Quality Standards Directive [2008/105/EC] (also known as the Priority Substances Directive), as amended by Directive 2013/39/EU. • Environmental Liability Directive [2004/35/EC] • A Blueprint to Safeguard Europe's Water Resource (COM(2012)73) *Waste* • Waste Electrical and Electronic Equipment Directive [2002/96/EC], as recast by [201219/EU] • Waste Framework Directive [2008/98/EC] *Cultural Heritage* • Valetta Treaty (1992) • Granada Treaty (1985) • World Heritage Convention [WHC-2005/WS/02] *Landscape* • European Landscape Convention [ETS No. 176]
National / Regional Level	*Biodiversity* • Biodiversity Strategy for Northern Ireland to 2020 • UK Post-2020 Biodiversity Framework • Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) • Wildlife and Natural Environment Act (NI) 2011, amending The Wildlife (Northern Ireland) Order 1985

Level	Plan / Programme / Policy / Legislation
	• The Environment (Northern Ireland) Order 2002 • DAERA Conservation Management Plans for SACs (in prep.) • Fisheries Act (Northern Ireland) 1966 (as amended) • UK National Ecosystem Assessment (2011) • Northern Ireland Species and Habitat Action Plans • Northern Ireland Peatland Strategy 2021-2040 • (ROI) National Biodiversity Action Plan 2017-2022 and Ireland's 4th National Biodiversity Action Plan (draft, 2022) *Population / Human Health* • Control of Major Accident Hazards Regulations (Northern Ireland) 2015 *Climate Change / Air Quality* • Northern Ireland's second Climate Change Adaptation Programme (NICCAP2) 2019 – 2024 • UK Climate Change Act 2008 • Change Act 2008 (2050 Target Amendment) Order 2019 • Climate Change (Northern Ireland) Act 2022 • UK Climate Change Risk Assessment 2022 • (RoI) National Adaptation Framework 2018 • (RoI) Climate Action Plan 2023 • (RoI) National Energy and Climate Plan 2021-2030 • (RoI) National Energy and Climate Plan 2021-2030 • The National Emissions Ceiling Regulations 2018 • UK National Air Pollution Control Programme (NAPCP) 2023 • The Environment Act 2021 and The Environment (2021 Act) (Commencement and Saving Provision) Order (Northern Ireland) 2022 • Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (due to be amended May 2023) • Air Quality Standards Regulations (Northern Ireland) 2010 • The Pollution Prevention and Control (Industrial Emissions) (Amendment) Regulations (Northern Ireland) 2018 • Clean Air Strategy for Northern Ireland – A Public Discussion Document, 2020 *Sustainable Development* • Northern Ireland Energy Strategy – the Path to Net Zero (2021) • Energy Strategy for Northern Ireland – the Path to Net Zero Energy. Action Plan (2022) • Draft Offshore Renewable Energy Action Plan 2022 • (RoI) Offshore Renewable Energy Development Plan (OREDP) 2014, and draft OREDP II • A Green Future: Our 25 Year Plan to Improve the Environment 2018 • Draft Environment Strategy for Northern Ireland 2022 • Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 • The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 • Northern Ireland Executive Programme for Government 2016-2021 • Programme for Government Draft Outcomes Framework 2021 • Strategic Planning Policy Statement for Northern Ireland 2015 • Planning Policy Statements 1 – 23 • The Regional Development Strategy 2035 – Shaping Our Future • (RoI) National Planning Framework (Project Ireland 2040) • UK Sustainable Development Strategy • 10X Economy – An Economic Vision for a Decade of Innovation 2021

Level	Plan / Programme / Policy / Legislation
	• Draft Green Growth Strategy for Northern Ireland – Balancing our Climate, Environment and Economy 2021 • Draft Rural Policy Framework for Northern Ireland 2021 • Shaping Our Electricity Future Roadmap. Version 1.1, 2023 • (ROI) Grid Implementation Plan 2017-2022 for the Electricity Transmission System in Ireland • (ROI) Draft Transmission Development Plan 2023 – 2032. Eirgrid. • (RoI) National Planning Framework 2018 *Water* • Water Environment (Floods Directive) (Amendment) Regulations (Northern Ireland) 2018 • The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017 • Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015 • UK Marine Strategy Regulations 2010 • The Quality of Bathing Water Regulations (Northern Ireland) 2008 • Private Water Supplies Regulations (Northern Ireland) 2017 • Water Supply (Water Quality) Regulations (Northern Ireland) 2017 • Environmental Liability (Prevention and Remediation) Regulations 2009 and amendment • Groundwater Regulations (Northern Ireland) 2009 and amendments • Pollution Control and Local Government (Northern Ireland) Order 1978 • Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006 and amendment Regulations 2007 • Water (Northern Ireland) Order 1999 (including amendments up to 2004) • NI Flood Risk Management Plan, 2021-2027 • Marine Act (NI) 2013 • Marine and Coastal Access Act 2009 • UK Marine Policy Statement 2011 • Draft Marine Plan for Northern Ireland 2018 • Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026 • Draft 3rd cycle River Basin Management Plan (RBMP) for Northern Ireland 2021-2027 • (RoI) Draft River Basin Management Plan for Ireland 2022-2027 • (RoI) National Marine Planning Framework 2021 • (RoI) Catchment Flood Risk Assessment and Management (CFRAM) Programme 2016 • (RoI) National Water Resources Plan (NWRP in prep.) and Framework Plan 2021 *Waste* • Northern Ireland Waste Management Strategy, 2012 (new Strategy under development 2023) • Draft Waste Management Plan for Northern Ireland 2019 • Waste and Contaminated Land (Northern Ireland) Order 1997 (including updates) *Cultural Heritage* • Archaeology 2030 – A Strategic Approach for Northern Ireland • Historic Monuments and Archaeological Objects (NI) Order 1995 • Planning Act (NI) 2011 • The Regional Development Strategy 2035 – RG11 • Conservation Principles guidance (DfC 2023) *Landscape* • Nature conservation and Amenity Lands Order (NI) 1985

Level	Plan / Programme / Policy / Legislation
	• Northern Ireland Regional Landscape Character Assessment 2016 • Northern Ireland Regional Seascape Character Assessment 2014 • (ROI) National Landscape Strategy for Ireland 2015-2025
Sub-Regional Level	• Local Biodiversity Action Plans (LBAPs) • Local Development Plans / Draft Plan Strategies

5 ASSESSMENT METHODOLOGY

This Environmental Report has been produced to assess the potential environmental effects of the options / projects proposed as part of the draft TDPNI and to provide environmental guidance in the further development and implementation of these options to ensure that they are sustainable. In conjunction with this, a Plan level HRA Report has also been prepared to inform the decision-making process, in terms of the potential for the proposed options to impact upon the integrity of any European sites in view of their conservation objectives.

5.1 Methodology

Assessment of the draft TDPNI was relatively strategic, with the aim of reporting likely impacts at the regional level to reflect the scale at which the options are being planned. Where appropriate, a regional perspective of the potential main issues and impacts of each option has been detailed by environmental topic area. Where possible this assessment is quantitative, with a graphical output to aid public appreciation and understanding of the implications of each proposed option in the TDPNI.

The approach used for assessing the TDPNI is a baseline-led assessment. This method involves an assessment of each option available in the enactment of the TDPNI against the following SEA topics and objectives:

- Biodiversity, Flora & Fauna (BFF)
- Population & Human Health (PHH)
- Geology, Soils and Land Use (GSL)
- Water (W)
- Air (A)
- Climatic Factors (CF)
- Material Assets & Infrastructure (MA)
- Cultural, Architectural & Archaeological Heritage (CH)
- Landscape & Visual Amenity (L)

The purpose of this is to predict and evaluate, as far as possible, the environmental effects of the TDPNI, highlighting any significant environmental problems and / or benefits that are likely to arise from its implementation.

To simplify the assessment process and avoid repetition during assessment of each potential option, the potential project types (e.g., overhead transmission lines, underground cables, substations) were first assessed generically for their potential effects against SEOs. This high-level assessment is provided in **Section 7.1**.

Following this high-level assessment of generic project types, each potential option / project in the TDPNI has been assessed in the short, medium and long term for likely effects, the significance of the effects, and whether they are positive or negative effects. Other impacts that have been assessed for significance are secondary effects, cumulative effects, synergistic effects, temporary and permanent effects, and the inter-relationship of effects. The scenario of “The Evolution of the Environment without the Plan” has also been assessed in the same format. This is considered the Do-Nothing Scenario.

All potential positive and negative impacts have been presented individually, with a text description, and then a summary graphic. In addition, a summary of the overall balanced potential effect has been presented for each environmental issue area. Scores have been assigned to impacts, which range from +3 to -3 as demonstrated in **Table 5-1**. The purpose of adding numerical scores is to assist in the ranking of options and for potential incorporation of the environmental and social criteria into future decision making by the TDPNI team, as this can easily be tied into a multi-criteria analysis of alternatives, if desired. Like the assessment, the scores demonstrate both the positives and the negatives and have not been conveyed in terms of net benefit or net loss, which can sometimes be misleading.

Table 5-1 Description of SEA Environmental Impact Scores

Score	Description
+3	Significant positive environmental effects
+2	Moderate positive environmental effects
+1	Slight positive environmental effects
0	No environmental effects
-1	Slight negative environmental effects
-2	Moderate negative environmental effects
-3	Significant negative environmental effects

The environmental assessment of each potential option included within the TDPNI 2023-2032 has initially focused within an appropriate geographical study area. The intention in setting a study area for each potential option was to enable a focus on the potential environmental issues and sensitivities that could be affected by the project. This study area is of sufficient size to include all potential areas within which the proposed infrastructure comprising that option could be developed. The study area set for an option comprising a new transmission line is therefore much larger than that for an option comprising a new substation. Potential options that comprise upgrading works and asset replacement have a more focussed study area again, as these will be geographically limited to the location of existing infrastructure. The study areas for each option have been set based on evidence and best practice for transmission infrastructure, having significant regard to the findings of the EirGrid Evidence Based Studies from 2016, which were literature reviews and evidence-based field studies on the effects of development and operation of high voltage transmission lines on various environmental topics in Ireland. While these studies were undertaken for EirGrid, the results are equally applicable to SONI projects in Northern Ireland. The EirGrid Guidelines for Electricity Transmission Projects (listed in **Appendix A**) were also used to assist with this. **Figure 5-1** demonstrates the study areas used for the assessments of the potential projects.

It must be noted that the TDPNI is a Plan that prepares for future transmission infrastructure development; however, SONI can only be reactive to the predicted supply and demand of electricity. While the developments that actually move on to the project level and construction are decided by SONI, funding for this work is assessed on a case-by-case basis by the Utility Regulator. Under SONI's licence, the Utility Regulator has the authority to direct derogation from the Transmission System Security and Planning Standards should it determine that any particular solution would not be economic for customers to fund through tariffs. Similarly, this SEA Environmental Report will not identify preferred solutions for transmission infrastructure. It will, however, provide SONI with very useful information for their future sustainable planning of grid reinforcement, should they decide that certain developments are required to move ahead to the project level to ensure continuing compliance with standards.

The HRA for the draft TDPNI has investigated the potential impacts of the proposed options on European sites (National Site Network Sites) and may cover a much wider study area and zones of influence to address ex situ impacts to habitats and species.

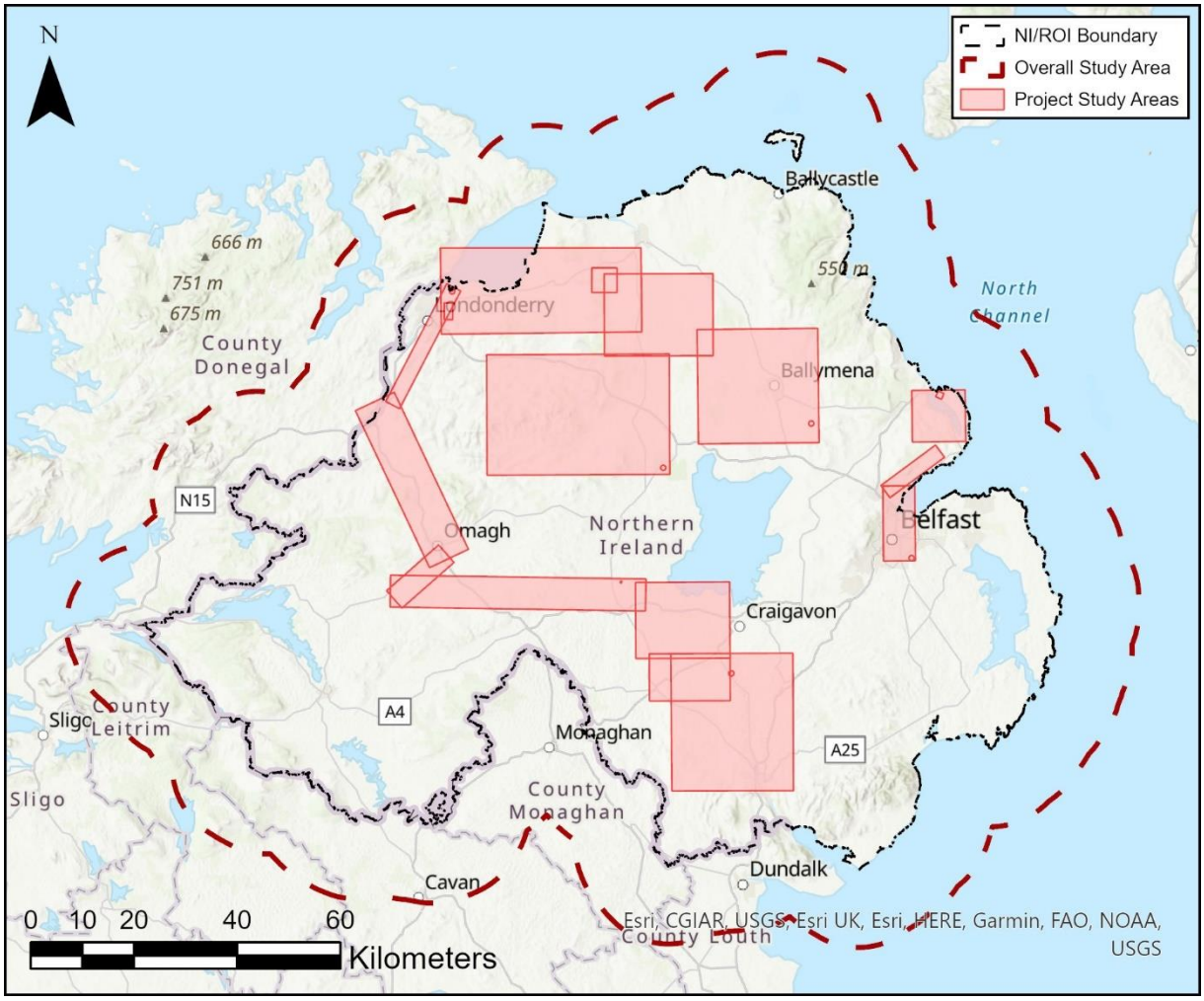


Figure 5-1 TDPNI Assessment Study Areas

5.2 Strategic Environmental Objectives

The options available to the TDPNI have been assessed in terms of their potential effects, and the significance of these effects, on the environment against a set of strategic environmental objectives (SEOs). These SEOs were developed in the context of broader environmental protection objectives set at both international and national level (outlined in **Section 4** and detailed in **Appendix B**), and also took into account the context of potential for effects associated with the TDPNI. Each of the environmental topics described in **Section 4** was assigned at least one high-level SEO, specifying a desired outcome, against which the potential projects set out in the draft TDPNI could be assessed. Each high-level SEO was paired with a specific target(s), as well as indicator(s) that can be used to measure the progress towards achievement of these targets.

The SEOs, Sub-Objectives, Indicators and Targets used are given in **Table 5-2.** The assessment examined the likely significant effects of the proposed options comprising the draft TDPNI, and how their implementation could contribute to achieving these SEOs.

Table 5-2 Draft Strategic Environmental Objectives, Indicators and Targets.

SEA Topic		Objective		Sub-Objective(s)	Indicators	Targets
Biodiversity, Flora & Fauna	**1**	Avoid damage to, and where possible enhance, biodiversity, flora and fauna.	**A**	Preserve, protect, maintain and, where possible, enhance internationally protected species and habitats.	• Conservation condition of designated habitats and species within International / European sites (SACs, SPAs, Ramsar sites).	• No negative change, or a positive change, in the conservation status of designated habitats and species within International / European sites.
			B	Preserve, protect, maintain and, where possible, enhance national and local nature conservation sites, protected habitats and species and other known species of conservation concern.	• Status of designated habitats and species within national and local sites. • Status of protected and priority habitats and species.	• No negative change, or a positive change, in the conservation status of designated habitats and species within national and local sites. • No negative change, or a positive change, in the status of protected or priority species and habitats outside of designated sites.
Population & Human Health	**2**	Minimise the risk to, and provide benefit for, the community and human health.	**A**	Minimise disruption and displacement to the local population, while providing robust transmission infrastructure.	• Population density within proximity to potential transmission system developments.	• Low population density within proximity to transmission system developments.
			B	Minimise risks to human health and social deprivation, while providing robust transmission infrastructure.	• Perceived health of the local population within proximity to potential transmission system developments. • Socially sensitive areas within proximity to potential transmission system developments.	• No negative change, or a positive change, in the health of the population within proximity to transmission system developments. • No socially sensitive areas within proximity to transmission system developments.

Geology, Soils and Land use	**3**	Minimise damage to the function and quality of the soil resource in the study area in construction and operation of transmission infrastructure.	**A**	Minimise damage to the function and quality of the soil resource in the study area in construction and operation of transmission infrastructure.	• Loss or damage to protected geological / geomorphological features within international or national designated sites (UNESCO Geoparks, ASSIs). • Loss or damage to sensitive soils and land uses, e.g., peatlands, ancient woodland, commercial forestry, cultivated lands. • Interactions with potentially hazardous soils and activities, e.g., PPC sites, mines, quarries, historically contaminated sites. • Interactions with topographically difficult sites, e.g., steep slopes and uplands.	• No effects on protected geological / geomorphological features within international or national designated sites (UNESCO Geoparks, ASSIs). • No loss of, or damage to, sensitive soils and land uses. • No interaction with hazardous sites and topographically unsuitable areas.
Water	**4**	Avoid impacts on the status or quality of water bodies and avoid interaction with areas of flood risk.	**A**	Support the objectives of the WFD and Marine Strategy by avoiding damage to or deterioration of water status, quality and resource.	• WFD status of surface, coastal, transitional and groundwater bodies within proximity to potential transmission system developments. • Status of sensitive waterbodies, e.g., drinking and bathing waters within proximity to potential transmission system developments.	• No negative change, or a positive change, in the status of surface water and groundwater bodies, including sensitive water bodies, and potential to contribute to the achievement of water body objectives under the WFD. • No deterioration in the status of NI seas, and potential to contribute to the achievement of Good Environmental Status (GES) under the MSFD.
			B	Support the objectives of the Floods Directive by avoiding interactions with coastal, pluvial or fluvial flood extents.	• Medium probability flood extents - Pluvial and fluvial 100-year and coastal 200-year flood extents.	• No interaction with areas of flood risk.

Air	**5**	Minimise risk to local air quality and contribute to improving regional emissions.	**A**	Minimise risk to local air quality and contribute to improving regional pollutant emissions.	• Development in air quality sensitive areas. • Enable increased renewable energy connection to reduce requirements for fossil fuel burning.	• No transmission system developments within air quality sensitive areas. • Number of transmission system developments that may facilitate increased renewable energy connection.
Climatic Factors	**6**	Adaption of infrastructure to potential climatic change and reduction of GHG emissions from the energy supply sector in line with national commitments.	**A**	Adaption of infrastructure to potential climatic change.	• Medium probability climate change (cc) influenced flood extents - Pluvial and fluvial 100 year + cc and coastal 200 year +cc flood extents.	• No transmission system developments within areas of climate change flood risk, unless resilient to flooding.
			B	Contribute to a reduction in GHG emissions from the energy supply sector in line with national commitments.	• Enable increased renewable energy connection to reduce requirements for fossil fuel burning.	• Number of transmission system developments that may facilitate increased renewable energy connection.
Material Assets & Infrastructure	**7**	Provide new, robust electrical transmission infrastructure with minimal disruption to other assets and infrastructure.	**A**	Provide new, robust electrical transmission infrastructure with minimal disruption to other assets and infrastructure.	• Transmission infrastructure developed or upgraded. • Potential for impacts on transport (road, rail, air) and energy infrastructure (gas). • Potential for loss of or impacts to agricultural land assets.	• Number of transmission system developments developed or upgraded. • No disruption to transport and energy infrastructure. • No loss of agricultural land assets.
Cultural, Architectural & Archaeological Heritage	**8**	Protect, conserve, and enhance the historic environment and cultural heritage.	**A**	Protect International, National and Local Heritage Designations, and areas of heritage potential, and their settings.	• Potential for impacts on archaeological heritage features or their setting. • Potential for impacts on architectural heritage features or their setting. • Discovery of previously unknown archaeological heritage features.	• No negative change, or a positive change in the condition or setting of international, national and local heritage designations, in development and operation of infrastructure. • All new archaeological discoveries are reported in

						line with legislative requirements.
Landscape / Seascape & Visual Amenity	**9**	Protect the character and quality of landscapes / seascapes or visual amenity.	**A**	Minimise the potential for negative impacts on the character and quality of landscapes / seascapes or visual amenity.	• Landscape / seascape sensitivity to infrastructure development. • Potential for impacts on visually sensitive areas, such as AONBs and country parks.	• No negative change, or a positive change, in visual amenity or landscape / seascape character, in development and operation of infrastructure.

An objective compatibility appraisal was conducted to test the compatibility of the TDPNI 2023-2032 Objectives and Policies with the SEOs of this SEA Environmental Report. **Table 5-3** demonstrates this compatibility. The purpose of this appraisal is to demonstrate how the Objectives and Policies of the TDPNI incorporate and reflect environmental topics. Green boxes with a ✓ demonstrate where TDPNI and SEA Objectives are compatible, and the SEA Objective is incorporating the TDPNI Objective or Policy. Please note that Objectives / Policies not being compatible do not mean that they are in conflict, it only demonstrates where a TDPNI Objective and an SEA Objective are not similar. **Table 5-4** further demonstrates how TDPNI Objectives are encompassed with the SEOs.

Table 5-3 Compatibility of Objectives

TDPNI Objective / Policy	SEA Objective								
	BFF	PHH	GSL	W	A	CF	MA	CH	L
ENVP1	✓	✓	✓	✓	✓	✓	✓	✓	✓
ENVP2	✓					✓			
ENVP3	✓		✓			✓			
ENVP4	✓		✓	✓		✓			
ENVP5*	✓		✓	✓		✓			
ENVO1	✓			✓		✓			
ENVO2*	✓		✓	✓		✓			
ENVP5				✓	✓	✓	✓		
ENVP6	✓	✓			✓				
ENVO2	✓	✓			✓				
ENVO3		✓			✓				
ENVP7									✓
ENVO4									✓
ENVP8								✓	
ENVP9								✓	
ENVP10				✓		✓			
ENVP11				✓		✓			
ENVP12				✓		✓			
ENVO5		✓		✓		✓			
ENVP13		✓			✓				
ENVP14		✓			✓				
ENVP15		✓					✓		
ENVO6		✓					✓		
TP1		✓				✓	✓		
TP2							✓		

PDP1							✓		
PDP2							✓		
PDP3							✓		
PCP1	✓			✓			✓	✓	✓
PCP2	✓			✓			✓	✓	✓
PCP3							✓		
CEP1	✓	✓	✓						
CEP2	✓	✓	✓						
CEP3	✓	✓	✓				✓		

Table 5-4 SEOs Encompassing the TDPNI Objectives

Environmental Topic	Objective		Sub-Objective		Encompassed TDPNI Objectives
Biodiversity, Flora & Fauna	**1**	Avoid damage to, and where possible enhance, biodiversity, flora and fauna.	**A**	Preserve, protect, maintain and, where possible, enhance internationally protected species and their key habitats.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP3 - To avoid adverse effects on sites designated for nature conservation including, Special Conservation Areas, Special Protection Areas, RAMSAR Sites, Areas of Special Scientific Interest, and National Nature Reserves. ENVP4 - To protect NI priority species and habitats and other species protected under legislation in the development of any transmission infrastructure and to preserve key ecological linkage features. ENVP5* - To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland. ENVO1 - To prepare and utilise industry specific Ecology Guidelines for the development of Transmission projects. This will ensure a standard approach to ecological impact assessment for transmission projects. ENVO2 - To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5*. ENVP6 - To employ methods on transmission infrastructure which minimise noise emissions in line with best industry practice. ENVO2 - To give careful consideration to the siting of transmission infrastructure so as to ensure that noise-sensitive receptors are protected from potential noise emissions. PCP1 - To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure

					development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents. PCP2 - To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects. CEP1 - To consult and engage with statutory and non-statutory stakeholders, including communities, landowners and the general public, at the earliest appropriate stage of a project's development. CEP2 - To recognise and develop the essential role that communities, landowners and other stakeholders play in transmission infrastructure development, and to engage with different stakeholders as appropriate during the life of a grid development project. CEP3 – To ensure consultation and engagement feedback is appropriately considered in decision making.
			B	Preserve, protect, maintain and, where possible, enhance national and local nature conservation sites and protected species, or other known species of conservation concern.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP2 - To exercise its functions as a TSO in line with the Wildlife and Natural Environment Act (Northern Ireland) 2011 and the Northern Ireland Biodiversity Strategy (2015) to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions. ENVP3 - To avoid adverse effects on sites designated for nature conservation including, Special Conservation Areas, Special Protection Areas, RAMSAR Sites, Areas of Special Scientific Interest, and National Nature Reserves. ENVP4 - To protect NI priority species and habitats and other species protected under legislation in the development of any transmission infrastructure and to preserve key ecological linkage features. ENVP5* - To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to

					fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland. ENVO1 - To prepare and utilise industry specific Ecology Guidelines for the development of Transmission projects. This will ensure a standard approach to ecological impact assessment for transmission projects. ENVO2 - To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5*. ENVP6 - To employ methods on transmission infrastructure which minimise noise emissions in line with best industry practice. ENVO2 - To give careful consideration to the siting of transmission infrastructure so as to ensure that noise-sensitive receptors are protected from potential noise emissions. PCP1 - To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents. PCP2 - To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects. CEP1 - To consult and engage with statutory and non-statutory stakeholders, including communities, landowners and the general public, at the earliest appropriate stage of a project's development. CEP2 - To recognise and develop the essential role that communities, landowners and other stakeholders play in transmission infrastructure development, and to engage with different stakeholders as appropriate during the life of a grid development project. CEP3 – To ensure consultation and engagement feedback is appropriately considered in decision making.
Population & Human Health	**2**	Minimise the risk to, and provide benefit for, the	**A**	Minimise disruption and displacement to the local	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects.

		community and human health.		population, while providing robust transmission infrastructure.	ENVP6 - To employ methods on transmission infrastructure which minimise noise emissions in line with best industry practice. ENVO2 - To give careful consideration to the siting of transmission infrastructure so as to ensure that noise-sensitive receptors are protected from potential noise emissions. ENVO3 - To seek to preserve and maintain noise quality in accordance with good practice and relevant legislation. ENVP15 - To consider the potential impact upon tourism in the planning of transmission projects. ENVO6 - To identify the nature of tourism in a project area; to consider the cumulative / in combination impact on tourism of a project and to consider short term and long term impacts of grid development projects on tourism as appropriate. TP1 - To promote and facilitate the sustainable development of a high-quality transmission grid to serve the existing and future needs of the NI population. CEP1 - To consult and engage with statutory and non-statutory stakeholders, including communities, landowners and the general public, at the earliest appropriate stage of a project's development. CEP2 - To recognise and develop the essential role that communities, landowners and other stakeholders play in transmission infrastructure development, and to engage with different stakeholders as appropriate during the life of a grid development project. CEP3 – To ensure consultation and engagement feedback is appropriately considered in decision making.
			B	Minimise risks to human health and social deprivation, while providing robust transmission infrastructure.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP6 - To employ methods on transmission infrastructure which minimise noise emissions in line with best industry practice. ENVO5 - That all grid development proposals, and in particular, transmission substation developments, shall carry out, to an appropriate level of detail, a site-specific Flood Risk Assessment

					that shall demonstrate compliance with all current Guidelines, standards and best practice. The Flood Risk Assessment shall pay particular emphasis to residual flood risks, site-specific mitigation measures, flood-resilient design and construction, and any necessary management measures. ENVP13 - To preserve and maintain air quality in accordance with good practice and relevant legislation in the proposed construction of its transmission projects. ENVP14 - To ensure appropriate dust suppression during construction works.
Soils, Geology and Landuse	**3**	Minimise damage to the function and quality of the soil resource in the study area in construction and operation of transmission infrastructure.	**A**	Minimise damage to the function and quality of the soil resource in the study area in construction and operation of transmission infrastructure.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP3 - To avoid adverse effects on sites designated for nature conservation including, Special Conservation Areas, Special Protection Areas, RAMSAR Sites, Areas of Special Scientific Interest, and National Nature Reserves. ENVP4 - To protect NI priority species and habitats and other species protected under legislation in the development of any transmission infrastructure and to preserve key ecological linkage features. CEP1 - To consult and engage with statutory and non-statutory stakeholders, including communities, landowners and the general public, at the earliest appropriate stage of a project's development. CEP2 - To recognise and develop the essential role that communities, landowners and other stakeholders play in transmission infrastructure development, and to engage with different stakeholders as appropriate during the life of a grid development project. CEP3 – To ensure consultation and engagement feedback is appropriately considered in decision making.
Water	**4**	Avoid impacts on the status or quality of water bodies and avoid interaction with areas of flood risk.	**A**	Support the objectives of the WFD and Marine Strategy by avoiding damage to or	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP4 - To protect NI priority species and habitats and other species protected under legislation in the development of any

				deterioration of water status, quality and resource.	transmission infrastructure and to preserve key ecological linkage features. ENVP5* - To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland. ENVO1 - To prepare and utilise industry specific Ecology Guidelines for the development of Transmission projects. This will ensure a standard approach to ecological impact assessment for transmission projects. ENVO2 - To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5*. PCP1 - To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents. PCP2 - To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects.
			B	Support the objectives of the Floods Directive by avoiding interactions with coastal, pluvial or fluvial flood extents.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP5 - To integrate measures related to climate change into grid development, by way of both effective mitigation and adaptation responses, in accordance with available guidance and best practice. ENVP10 - That there is no increase in flood risk as a result of transmission development, and to ensure any flood risk to the development is appropriately managed. ENVP11 - To promote the use of sustainable urban drainage systems in any new developments where it is appropriate. ENVP12 - To have regard to Planning Policy Statements and Supplementary Planning Guidance: PPS 15 Planning and Flood

					Risk Development Control Considerations in the preparation of grid development strategies and plans. ENVO5 - That all grid development proposals, and in particular, transmission substation developments, shall carry out, to an appropriate level of detail, a site-specific Flood Risk Assessment that shall demonstrate compliance with all current Guidelines, standards and best practice. The Flood Risk Assessment shall pay particular emphasis to residual flood risks, site-specific mitigation measures, flood-resilient design and construction, and any necessary management measures. PCP1 - To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents. PCP2 - To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects.
Air	**5**	Minimise risk to local air quality and contribute to improving regional emissions	**A**	Minimise risk to local air quality and contribute to improving regional emissions	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP5 - To integrate measures related to climate change into grid development, by way of both effective mitigation and adaptation responses, in accordance with available guidance and best practice. ENVP6 - To employ methods on transmission infrastructure which minimise noise emissions in line with best industry practice. ENVO2 - To give careful consideration to the siting of transmission infrastructure so as to ensure that noise-sensitive receptors are protected from potential noise emissions. ENVO3 - To seek to preserve and maintain noise quality in accordance with good practice and relevant legislation. ENVP13 - To preserve and maintain air quality in accordance with good practice and relevant legislation in the proposed construction of its transmission projects. ENVP14 - To ensure appropriate dust suppression during construction works.

Climatic Factors	**6**	Adaption of infrastructure to potential climatic change and reduction of GHG emissions from the energy supply sector in line with national commitments.	**A**	Adaption of infrastructure to potential climatic change.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP2 - To exercise its functions as a TSO in line with the Wildlife and Natural Environment Act (Northern Ireland) 2011 and the Northern Ireland Biodiversity Strategy (2015) to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions. ENVP3 - To avoid adverse effects on sites designated for nature conservation including, Special Conservation Areas, Special Protection Areas, RAMSAR Sites, Areas of Special Scientific Interest, and National Nature Reserves. ENVP4 - To protect NI priority species and habitats and other species protected under legislation in the development of any transmission infrastructure and to preserve key ecological linkage features. ENVP5* - To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland. ENVO1 - To prepare and utilise industry specific Ecology Guidelines for the development of Transmission projects. This will ensure a standard approach to ecological impact assessment for transmission projects. ENVO2 - To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5*. ENVP5 - To integrate measures to address climate change into grid development, by way of both effective mitigation and adaptation responses, in accordance with available guidance and best practice. ENVP10 - That there is no increase in flood risk as a result of transmission development, and to ensure any flood risk to the development is appropriately managed. ENVP11 - To promote the use of sustainable urban drainage systems in any new developments where it is appropriate.

					ENVP12 - To have regard to Planning Policy Statements and Supplementary Planning Guidance: PPS 15 Planning and Flood Risk Development Control Considerations in the preparation of grid development strategies and plans. ENVO5 - That all grid development proposals, and in particular, transmission substation developments, shall carry out, to an appropriate level of detail, a site-specific Flood Risk Assessment that shall demonstrate compliance with all current Guidelines, standards and best practice. The Flood Risk Assessment shall pay particular emphasis to residual flood risks, site-specific mitigation measures, flood-resilient design and construction, and any necessary management measures.
			B	Contribute to a reduction in GHG emissions from the energy supply sector in line with national commitments.	TP1 - To promote and facilitate the sustainable development of a high-quality transmission grid to serve the existing and future needs of the NI population.
Material Assets & Infrastructure	**7**	Provide new, robust electrical transmission infrastructure with minimal disruption to other assets and infrastructure.	**A**	Provide new, robust electrical transmission infrastructure with minimal disruption to other assets and infrastructure.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP5 - To integrate measures to address climate change into grid development, by way of both effective mitigation and adaptation responses, in accordance with available guidance and best practice. ENVP15 - To consider the potential impact upon tourism in the planning of transmission projects. ENVO6 - To identify the nature of tourism in a project area; to consider the cumulative / in combination impact on tourism of a project and to consider short term and long term impacts of grid development projects on tourism as appropriate. TP1 - To promote and facilitate the sustainable development of a high-quality transmission grid to serve the existing and future needs of the NI population. TP2 - To consider all practical technology options in the development of projects, including maximising use of existing transmission grid.

					PDP1 - To engage with stakeholders in accordance with SONI's Process for Developing the Grid in Northern Ireland. PDP2 - To promote sustainable grid development by balancing complex and/or competing technical, economic, environmental, social and deliverability goals and priorities in decision-making. PDP3: To ensure that grid development is carried out in an economically efficient manner, and seek derogation from the Utility Regulator when this is not possible. PCP1 - To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents. PCP2 - To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects. PCP3 - To promote sustainable grid development by balancing complex and/or competing technical, economic and environmental goals and priorities in decision-making. CEP3 – To ensure consultation and engagement feedback is appropriately considered in decision making.
Cultural, Architectural & Archaeological Heritage	**8**	Protect, conserve, and enhance the historic environment and cultural heritage.	**A**	Protect International, National and Local Heritage Designations, and areas of heritage potential, and their settings.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP8 - To take reasonable measures to ensure that the special interest of protected structures, including their curtilages and settings, are protected when considering site or route options for the planning of transmission infrastructure. ENVP9 - To protect archaeological material when planning transmission infrastructure, by avoidance or by best practice mitigation measures. PCP1 - To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents.

					PCP2 - To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects.
Landscape & Visual Amenity	**9**	Protect the character and quality of landscapes / seascapes or visual amenity.	**A**	Minimise the potential for negative impacts on the character and quality of landscapes / seascapes or visual amenity.	ENVP1 - To promote best environmental practice in the design and appraisal of transmission development projects. ENVP7 - To have regard to the Northern Ireland Landscape Character Assessment 2000, and the Northern Ireland Seascape Character Assessment in the design and appraisal of its transmission development projects. ENVO4 - To protect landscapes through the sustainable planning and design of transmission infrastructure and to have regard to important landscape designations including AONBs and the World Heritage Site. PCP1 - To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents. PCP2 - To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects.

5.3 Environmental Constraints Modelling

The outputs of this Environmental Report demonstrate the high-level potential impacts of developing each project, which are the alternatives available to the TDPNI to reinforce the electrical transmission grid and meet the needs of generation and capacity for Northern Ireland. A combined sensitivity baseline for use in this SEA has also been produced, to demonstrate the areas of higher or lower constraint to electricity transmission development in Northern Ireland. This is called constraint modelling and uses Geographical Information Systems (GIS) to add many layers of environmental sensitivities together to produce combined sensitivity or constraint maps. Avoidance of areas of high sensitivity and high constraint will help towards more sustainable planning by SONI in development of the transmission system. Constraint modelling for the TPDNI was developed bespoke for the study, however this practice of GIS modelling and sensitivity / constraint mapping is recommended in publications such as the GISEA Manual (EPA, 2016)[93]. The environmental indicators (sensitivities and constraints) that were used in this modelling, along with a brief description and their relative scoring are provided in **Table 5-5**. The relative constraint scores were developed between the environmental and transmission development professionals undertaking the study. The higher the relative constraints score the more important or sensitive the constraint to electricity transmission development. For the most part, these constraint scores are those that are used as standard by SONI for project-level modelling of constraints. The highest-scoring constraints represent areas that are designated, or of importance, at an international level, that could lead to the most social disturbance, or present the greatest technical difficulty. Medium-scoring constraints represent areas that are designated, or of importance, at a national level, that could lead to moderate social disturbance, or present moderate technical difficulty. Lower-scoring constraints represent areas that are designated, or of importance, at a local level, that could lead to some social disturbance or some technical difficulty.

This modelling has been undertaken using ArcGIS Spatial Analyst. For each potential project the output constraints map demonstrates the overall sensitivity in that potential area for development of transmission infrastructure. Geographical buffers have been applied to the proposed data, based on the findings of the EirGrid Evidence Based Studies, to minimise risks to sensitive receptors.

Table 5-5 Constraints Model Data and Relative Scores

Data / Indicators	Description	Relative Constraints Score
Special Areas of Conservation	Areas designated in accordance with the Habitats Directive (92/43/EEC), including those in RoI (transboundary).	10
Special Protection Areas	Areas designated in accordance with the Birds Directive (EC/79/409), including those in RoI (transboundary).	10
Ramsar Sites	Areas designated under the Ramsar convention, including those in RoI (transboundary).	10
Areas of Special Scientific Interest	Areas designated under the Environment (Northern Ireland) Order 2002.	5
Natural Heritage Areas and pNHAs (RoI)	Areas designated under the Wildlife Act 1976 in Ireland (transboundary).	5
Sites of Local Nature Conservation Interest	Local planning designations.	5
Nature Reserves / National Nature Reserves	Managed nature reserves.	5
Marine Conservation Zones	Areas designated under the Marine Act (Northern Ireland) 2013	5

[93] https://www.opr.ie/wp-content/uploads/2019/11/EPA-GISEA-Manual.pdf

Shellfish and aquaculture areas	Areas licenced for shellfish and aquaculture activity.	3
RSPB Reserves	Reserves managed by the Royal Society for the Protection of Birds	3
Salmon rivers / lakes	Rivers and lakes known to be important for salmonids.	10
Freshwater pearl mussel catchments	Catchments known to be inhabited by freshwater pearl mussels (*Margaritifera margaritifera*).	5
Population density	Number of people per km^2, distributed across Northern Ireland. Quantile distribution. Calculated within NISRA small area outputs. Low score is low relative population density, high score is high relative population density.	1 - 5
Settlements	Settlement areas – cities, towns, villages, hamlets.	10
Population health	Perceived health of the population. Areas of lower perceived health are high score; areas of better perceived health are low score.	1 - 5
Neighbourhood Renewal Areas	Neighbourhoods in Northern Ireland identified as experiencing the most severe multiple deprivation and have been chosen to receive support under the Department of Social Development People and Place strategy for Neighbourhood Renewal.	3
Peace lines	Northern Ireland Office (NIO) peace lines, as of October 2006.	3
Peat / bogs	Areas of peat and bog.	10
Quarries / Mines / Unstable land / Landslides	Quarries and mines, known mines, unstable ground, and landslides.	5
Cultivated lands	Cultivated lands – orchards (LPSNI).	5
Forest Service lands	Forest Service lands.	3
Ancient woodland	Ancient woodland.	5
Historic land use	Potential historically contaminated land.	5
PPC sites	Pollution Prevention and Control (PPC) sites.	5
Upland areas	Lands greater than 150m elevation – Upland.	10
Steep slopes	Slopes greater than 30 degrees.	10
WFD Rivers	WFD Rivers	3
WFD Lakes	WFD Lakes	3
Drinking water rivers / lakes	Rivers and lakes used for drinking water abstraction.	5
Bathing waters	Designated bathing waters.	5
Flood extents 100 year	Fluvial, Pluvial and Coastal flood extents for the current day scenario 100 or 200-year event.	5
Flood extents 100 year+ climate change	Fluvial, Pluvial and Coastal flood extents for the climate change scenario 100 or 200-year event.	3
Gas pipelines	Gas transmission lines.	5
Electricity Transmission Network	Electricity Transmission Network	5
Roads	Major roads (dual, A-Roads and motorways).	3

Railways	Railway lines.	3
Airports	Airport lands.	10
Sites and Monuments (SMR)	Archaeological monuments recorded in the Northern Ireland Sites and Monuments Record.	5
Scheduled Zones	Zones scheduled for protection under Article 3 of The Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995.	5
Listed Buildings	Listed Buildings within Northern Ireland.	5
Industrial Heritage Sites	Industrial Heritage Sites.	5
Defence Heritage Sites	Defence Heritage Sites.	5
Areas of Significant Archaeological Interest	Non-statutory designations that seek to identify distinctive areas of the historic landscape in Northern Ireland.	5
Areas of Archaeological Potential	Areas within the historic cores of towns and villages, where, on the basis of current knowledge, it is likely that archaeological remains will be encountered in the course of continuing development and change.	5
Historic Parks and Gardens	Boundaries of protected historic parks, gardens and demesnes in Northern Ireland. Northern Ireland Heritage Gardens Archive.	5
World Heritage Site	UNESCO designated world heritage site – Giants Causeway.	10
Areas of Outstanding Natural Beauty	Areas designated under the Amenity Lands Act (Northern Ireland) 1965 and the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985.	5
Sensitivity of landscape to wind farm development	NIEA guidance based on landscape character assessment. Four categories.	1 - 5
Country Parks	NIEA Country Parks.	3
National Trust lands	National Trust Lands.	3

Figure 5-2 demonstrates the output of the constraints model for Northern Ireland and the border region into the Republic of Ireland. It should be noted that SONI can only develop grid infrastructure within Northern Ireland, therefore the majority of the constraints are Northern Ireland based. The only receptors included from the Republic of Ireland side are Special Areas of Conservation, Special Protection Areas, Ramsar Sites, Natural Heritage Areas (NHAs) and proposed NHAs (pNHA), for potential transboundary impacts from the SONI development in Northern Ireland.

The constraint map is often called a “heat map”, demonstrating areas of higher and lower sensitivity / constraint to electrical transmission development, relative to one another. This map also sets the sensitivity basis for least cost environmental corridor modelling, which will demonstrate the least environmentally sensitive corridor between two substations. The more constraints within an area the more difficult it is to cross in the model, replicating how it will be more difficult to plan and construct a line or substation through or within highly constrained areas. The constraint model is a cost raster (not financial) that identifies the relative cost of travelling through each cell (120 m x 120 m area) in the model, which represents the ease or difficulty in developing a transmission line across a given area in the real world. An area of higher environmental sensitivity will “cost” the model more to cross than an area of lower environmental sensitivity. The model tries to cross between two points in the least overall “cost”. To create this raster, the relative cost (constraint value) of constructing a transmission line through each cell is determined (from **Table 5-5**). For the purposes of the environmental assessment, as there are currently no specific routes for the proposed TDPNI developments, route swathes were generated for the proposed new circuit developments to demonstrate the potential route corridors within 1% of the least cost line, i.e., corridors of low social and environmental constraints. In line with the SONI planning framework, at the next stages of detailed feasibility, SONI will look to use these corridors,

along with technical and economic criteria, to determine the most sustainable routes to be taken. For new substations, the area of lower constraint within the study area has been used as the area for assessment; this is the area with the lower half of the study area scores, while the areas with higher constraint scores are proposed to be avoided. For line and substation uprates, extensions and restrings, the constraints at the existing infrastructure have been assessed, i.e., the infrastructure is not proposed to move.

These route corridors and lower constraint areas can be used as a guide by SONI in their transmission development planning. These would be the general areas recommended to be developed in, should a project be required to go ahead. However, following this strategic planning stage there is further technical, economic, environmental and social assessments to be undertaken on potential route corridors at more detailed stages of feasibility.

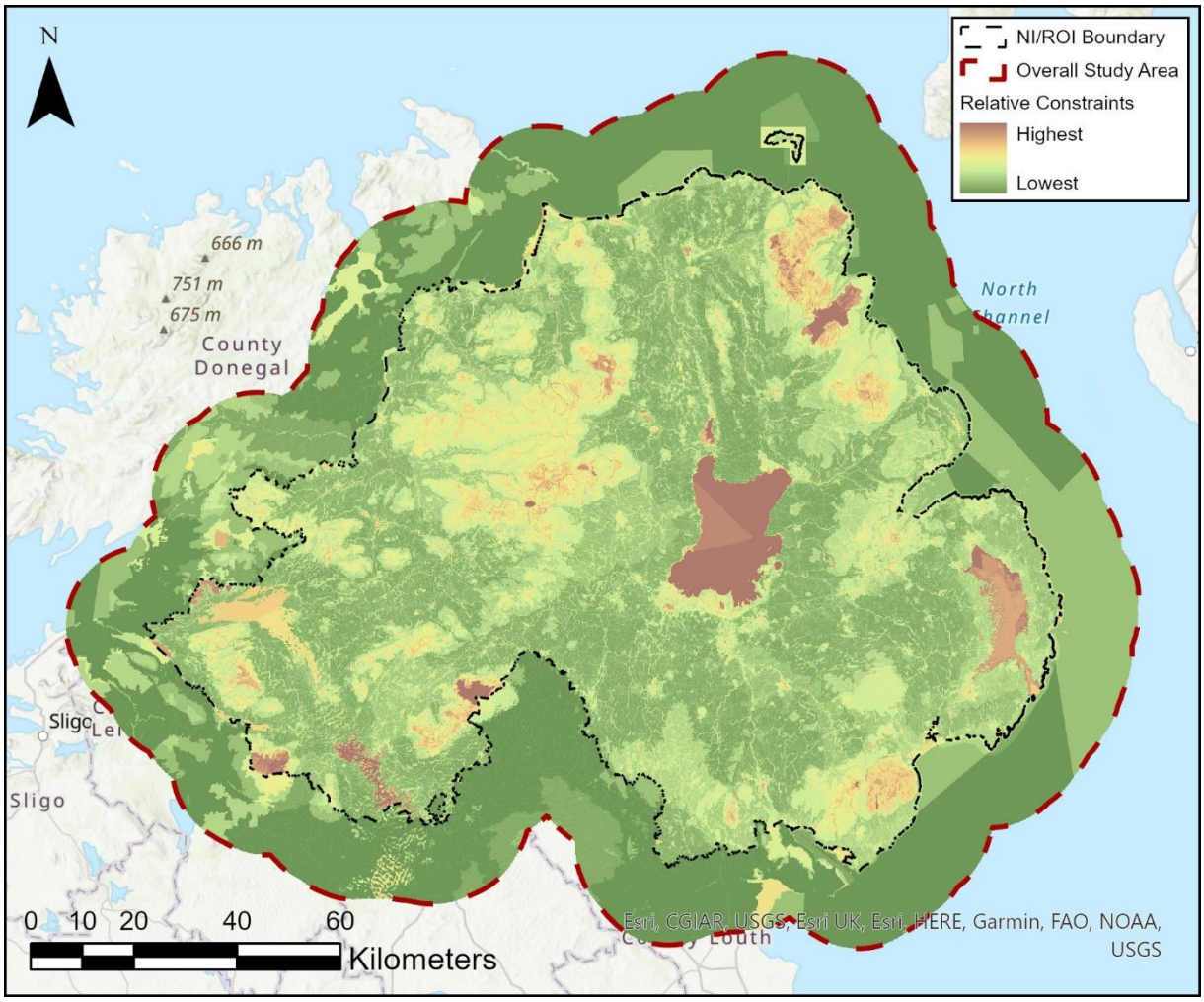


Figure 5-2 SONI TDPNI Constraints Model Output

5.4 Difficulties and Data Gaps

As with any national scale assessment, difficulties were encountered due to the large scale of the TDPNI and the many projects proposed. The large area covered by all the proposed study areas leads to issues finding and using consistent and reliable information that is replicable across all proposed developments.

The drivers for and governance of transmission planning in Northern Ireland also led to issues with the SEA. This is discussed previously in **Section 5-1** of this SEA Environmental Report; whereas the developments from the TDPNI that actually move on to the project level and construction are decided by SONI, funding for this work is assessed on a case-by-case basis by the Utility Regulator. Under SONI's licence, the Utility Regulator has the authority to direct derogation from the Transmission System Security and Planning Standards should it determine that any particular solution would not be economic for customers to fund through tariffs. Similarly, this SEA Environmental Report will not identify preferred solutions for transmission

infrastructure but will provide SONI with very useful information for their future sustainable planning of grid reinforcement, should they decide that certain developments are required to move ahead to the project level to ensure continuing compliance with standards.

6 CONSIDERATION OF ALTERNATIVES

6.1 Consideration of Alternatives

The SEA process must include an evaluation of the likely environmental consequences of a range of reasonable alternative scenarios, which in this case are alternatives to the draft TDPNI. The purpose of this section is to outline the reasons for choosing the draft TDPNI as the preferred alternative in light of other reasonable alternatives considered.

6.2 Consideration of Strategic-Level Alternatives

The following strategic-level alternatives can be considered for the draft TDPNI 2023-2032:

- Alternative 1 – No Plan option: strategic development occurs in an ad hoc manner (essentially a 'Do-Nothing' scenario from a plan making and SEA perspective).

- Alternative 2 – Strategy option: no new Plan for the period 2023-2032 but reference to provisions of the existing TDPNI 2018-2027. Note that while this can be considered by the SEA process as a potential strategic alternative, in practice it would be complicated by the commencement of projects since the existing plan was published in addition to changes in likely project costs, etc.

- Alternative 3 – Preparation and adherence to the specific policies and objectives for development as set out in the TDPNI 2023-2032.

6.2.1 Strategic Alternative 1

If there is no TDP for Northern Ireland, individual projects may be progressed without strategic level planning. There is the potential for neutral to significant negative impacts on the SEOs for Biodiversity, Flora, and Fauna, depending on the individual projects that are progressed and their connectivity with protected and priority sites and species. These are likely to be short-term for the most part but may be long-term or permanent where direct loss of, or damage to, protected sites, habitats or species occurs. In the absence of the plan, there would be legislative safeguards in place for the protection of certain sites and species at the project level; however, there would be an absence of strategic-level policies and objectives for the development of transmission infrastructure that ensure that biodiversity is factored into decision making.

In the absence of the plan, construction and maintenance works to the electricity transmission infrastructure in Northern Ireland would be ad hoc. There is the potential for neutral to significant negative impacts to the SEOs for Population and Human Health in the short- to long-term, depending on the individual projects that are progressed and their connection to settlement areas and socially sensitive areas. With projected population growth, in the medium- and long-term this ad hoc approach may result in an unreliable supply of electricity in some areas due to lack of planning and insufficient development of infrastructure. Disruptions of supply could result in detrimental impacts upon the delivery of essential services, which in turn could have economic and social consequences. There is the potential for an ongoing reliance upon fossil fuels due to a lack of collaborative planning, reducing the connection of renewable energy sources to the supply network. In the medium- and long-term this is likely to result in ongoing detrimental impacts on human health (and negative impacts on SEOs for Population and Human Health), which will worsen going forward from the medium- to the long-term.

Without a TDP for Northern Ireland, there is the potential for neutral to moderate effects on the SEO for Geology, Soils and Land use owing to construction-phase loss of, and compaction of, soils, loss of land uses, and interaction with potentially hazardous sites. Impacts would primarily be short-term in nature during construction, but long-term or permanent impacts are possible in the footprint of transmission developments.

In the absence of the plan, individual projects that are progressed have the potential for slight to moderate negative impacts on the SEOs for Water. There is the potential for slight to moderate impacts on river sections and WFD status, primarily short-term construction phase direct or indirect sedimentation or pollution impacts. Individual projects may still require a flood risk assessment to be undertaken; however, without the plan there would be no overarching strategic planning for selecting projects to achieve connectivity while avoiding areas of flood risk.

In the absence of the plan, there is the potential for short-term, construction-phase impacts on local air quality, including within air quality sensitive areas and the SEO for Air. There is also the potential for medium- and long-term detrimental impacts upon air quality within Northern Ireland and the SEO for Air, because an ad hoc approach may result in less connection of renewable energy sources to the electricity supply network. This is likely to result in the continued reliance upon finite fossil fuels and thus the ongoing, long-term emissions of pollutants into the atmosphere. With population growth and therefore increased electricity demand expected into the future, the severity of these impacts is likely to increase with time, in the absence of the Plan.

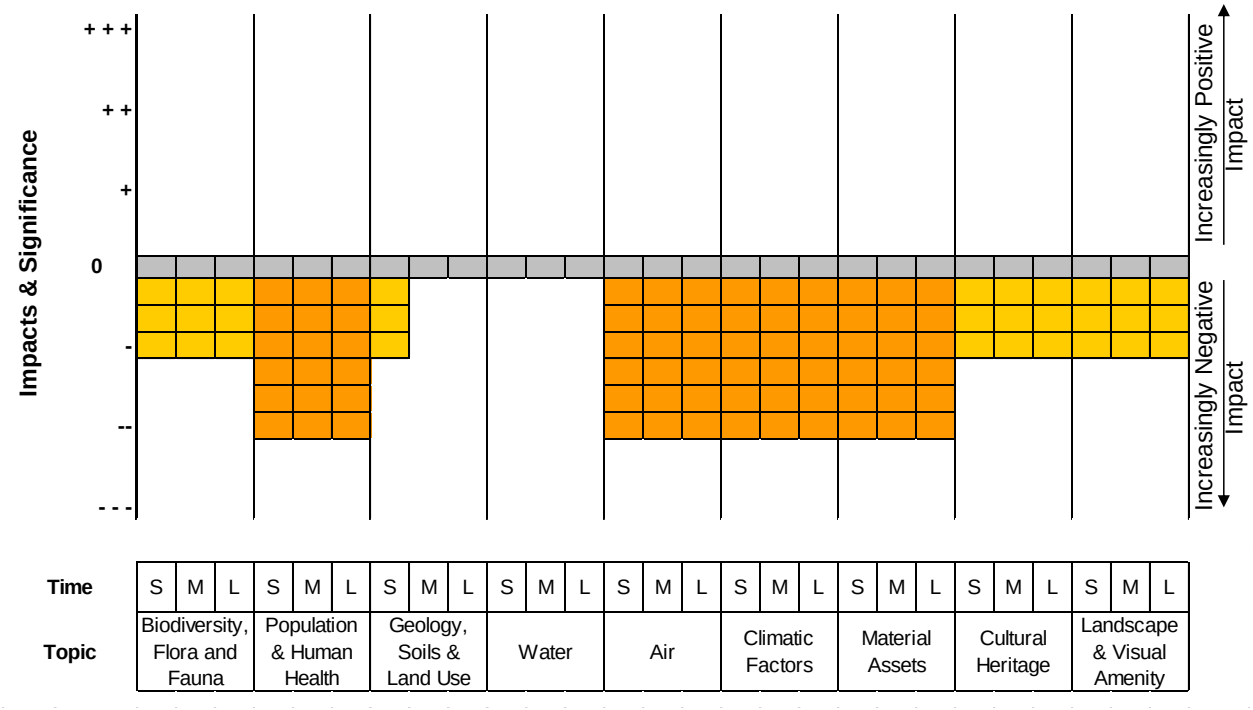
Without the plan, there is the potential for short-term, construction-phase impacts on GHG emissions and the SEO for Climatic Factors, and minor to moderate loss of GHG sequestering vegetation in the footprint of the developments. Individual projects may still require a flood risk assessment to be undertaken, including consideration of climate change flood risk; however, without the plan there would be no overarching strategic planning for selecting projects to achieve connectivity while avoiding areas of flood risk. There is also the potential for medium- and long-term detrimental impacts upon climatic factors within Northern Ireland and the SEO for Climatic Factors, as an ad hoc approach may result in less connection of renewable energy sources to the electricity supply network. The continued reliance upon fossil fuels to provide electricity in the medium- and long-term will contribute to the further acceleration of climate change and the exacerbation of the impacts of climate change. Impacts of climate change would worsen going forward from the medium- to the long-term as the volume of GHG in the atmosphere would continue to rise.

There are unlikely to be any short-term impacts on the Material Assets SEO in the absence of the Plan, as the current supply of electricity is likely to meet current demand. In the medium- to long-term, however, there is the potential for an ad hoc approach to result in electricity supply shortages in parts of Northern Ireland. A lack of strategic and collaborative planning of the future electricity transmission network may leave some areas unable to meet increased demand resulting from economic and population growth. There is also the potential for secondary impacts on other material assets such as rail and road, and also gas and water supply networks by way of disruption to services. These impacts have the potential to worsen going forward from the medium- to the long-term if demand continues to surpass supply in some underdeveloped areas.

If there is no TDP for Northern Ireland, individual projects may be progressed without strategic level planning. There is the potential for neutral to significant negative impacts on the SEO for Cultural Heritage, depending on the individual projects that are progressed and their connectivity with cultural heritage features. These are likely to be short-term for the most part but may be long-term or permanent where direct loss of, or damage to, protected features, or their setting, occurs. In the absence of the plan, there would be legislative safeguards in place for the protection of certain features at the project level; however, there would be an absence of strategic-level policies and objectives for the development of transmission infrastructure that ensure that cultural heritage protection is factored into decision making.

Without the plan, there is the potential for short-term construction phase, to permanent impacts in the case of new transmission infrastructure, on the SEO for Landscape and Visual Amenity. There would be an absence of strategic-level policies and objectives for the development of transmission infrastructure that ensure that landscape protection is factored into decision making.

In comparison to the draft TDPNI 2023-2032, there is likely to be the potential for slight, short- to long-term negative impacts on Biodiversity, Flora and Fauna, slight short-term negative impacts on Geology, Soils and Land use, and slight short- to long-term negative impacts on Cultural Heritage and Landscape and Visual Amenity. There is also the potential for slight to moderate, negative impacts on Population and Human Health, Air, Climatic Factors and Material Assets in the short- to long-term from this strategic alternative.



6.2.2 Strategic Alternative 2

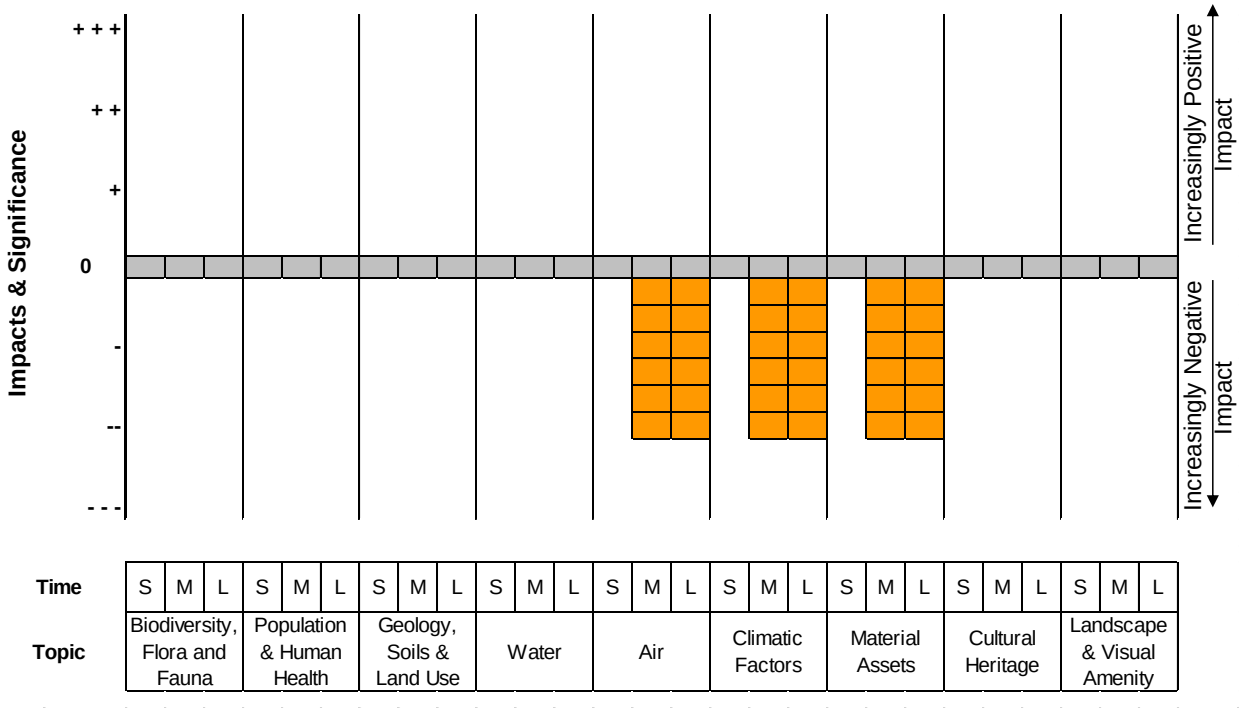
In the absence of a new TPDNI for the period 2023-2032, the existing TDPNI for the period 2018-2027 would remain in place. Some projects may still progress to development, that were included in this iteration of the plan, with the potential for positive and negative impacts on SEOs as established in the SEA Environmental Report that was published to accompany that plan. Any new, ad hoc projects that arise would be subject to the policies and objectives that were set out in that plan, providing overarching safeguards to environmental topics and SEOs.

Without an updated plan for 2023-2032, there is the potential for medium- and long-term negative impacts on the SEOs for Air, Climatic Factors and Material Assets.

There is the potential for detrimental impacts upon Air quality and Climatic Factors within Northern Ireland and the SEOs for these, because an ad hoc approach moving forward may result in less connection of renewable energy sources to the electricity supply network. This is likely to result in the continued reliance upon finite fossil fuels and thus the ongoing, long-term emissions of pollutants into the atmosphere. With population growth and therefore increased electricity demand expected into the future, the severity of these impacts is likely to increase with time. The continued reliance upon fossil fuels to provide electricity in the medium- and long-term will contribute to the further acceleration of climate change and the exacerbation of the impacts of climate change. Impacts of climate change would worsen going forward from the medium- to the long-term as the volume of GHG in the atmosphere would continue to rise.

There is the potential for negative effects on Material Assets in the medium- to long-term, as an ad hoc approach moving forwards may result in electricity supply shortages in parts of Northern Ireland. A lack of strategic and collaborative planning of the future electricity transmission network may leave some areas unable to meet increased demand resulting from economic and population growth.

In comparison to the draft TDPNI 2023-2032, there is likely to be the potential for slight to moderate negative impacts on Air, Climatic Factors and Material Assets in the medium- to long-term from this strategic alternative.



6.2.3 Strategic Alternative 3

The assessment of implementing the draft TDPNI for 2023-2032, i.e., Strategic Alternative No.3, has been undertaken in detail in the following Section 7. In this scenario, some or all of the potential projects, as outlined in Section 7, will be progressed, under the overarching Policies and Objectives as set out in the draft TDPNI or 2023-2032.

There is the potential for short- to long-term impacts across all SEOs from the implementation of the TDPNI for 2023-2032. However, the overarching policies and objectives set out in the plan would continue to provide protection to the environment at a strategic level. The policy and objective for biodiversity that are new to this iteration of the plan would also apply[94], with the potential for long-term positive effects on the SEOs for Biodiversity, Flora and Fauna.

Furthermore, the future implementation of projects arising from the TDPNI would have regard for the assessment outcomes from the SEA process, and the mitigation measures outlined, in ensuring that the environment is protected during project level planning and development.

6.3 Consideration of Alternative Options during Development of the TDPNI

In addition to consideration of the TDPNI 2023-2032 as a strategic-level alternative, each potential project can be considered as an alternative option available to the TDPNI 2023-2032 to reinforce the electrical transmission grid and meet the needs of generation and capacity for Northern Ireland. The various options / projects available to the TDPNI have all been assessed in terms of their potential effects, and the significance of these effects, on the environment against the SEOs in **Section 7**. This will allow for a comparison between the relative merits and drawbacks of the projects proposed by the TDPNI 2023-2032.

[94] ENVP5* To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland. ENVO2* To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5.

7 ENVIRONMENTAL ASSESSMENT OF THE TDPNI 2023-2032

The purpose of this section of the Environmental Report is to evaluate as far as possible the environmental effects of implementing the draft TDPNI 2023-2032, and to set out measures envisaged to prevent, reduce and as far as possible offset any significant adverse effects on the environment.

7.1 High-level Assessment of Potential Project Types

To simplify the assessment process and avoid repetition during assessment of each potential option, the potential project types described in **Section 2.4** have first been assessed at a high level for their potential effects against SEA environmental topics. The general development types identified are:

1. New transmission lines
    a. Overhead transmission lines
    b. Underground cables
2. Transmission Line Restring or Uprate
3. New Substation
4. Substation Extension or Upgrade

This high-level assessment is shown in **Table 7-1**.

Table 7-1 High-level assessment of general development types against SEA topics

Development Type	Description	Potential positive effects	Potential negative effects
New Transmission Lines: Underground Cables	Cables installed directly into the ground in an excavated trench. Cable routes usually located along public roads / open spaces. Joint bays occur every 500-700 m.	***Biodiversity, Flora and Fauna***	
		Installation / Construction Phase	
		• None anticipated.	• Excavation of trenches and joint bays has the potential for direct temporary construction phase disturbance to a permanent loss of designated or non-designated habitats and species in the footprint of these works, or along access routes during construction and maintenance activities. • Potential for short-term temporary construction-phase disturbance of fauna, including birds, in the vicinity of the works during construction and maintenance. • Potential for soil compaction to occur negatively affecting biodiversity. • Potential for the introduction or spread of invasive non-native species during the construction phase. • Potential for construction of transmission infrastructure to increase the risk of fire within the vicinity of the transmission corridor in the short long-term.
		Operational Phase	
		• None anticipated.	• Excavation of trenches and joint bays has the potential for direct temporary construction phase disturbance to permanent loss or deterioration of designated or non-designated habitats and species in the footprint of these works, or along access routes during construction and maintenance activities. • Potential for short-term temporary disturbance of fauna, including birds, in the vicinity of the works during maintenance phases. • Potential for operation of transmission infrastructure to increase the risk of fire within the vicinity of the transmission corridor in the short long-term. • Potential for medium- to long-term effects on wetland habitats should trenching works lead to a change in hydrological conditions. • Potential for future longer-term biodiversity damage if cable design / materials are inappropriate in terms of possible degradation occurrence.

		Population and Human Health	
		Installation / Construction Phase	
		• Potential for short- to long-term, temporary to permanent, increased employment opportunities from construction and maintenance activities.	• Potential for short-term temporary and localised disturbance from noise and dust during the construction-phase, including the potential for disturbance in socially sensitive areas. • Potential for short-term temporary disruption of the local population due to increased construction traffic during the construction phase.
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy in the medium- to long-term. • Potential for short- to long-term, temporary to permanent, increased employment opportunities from maintenance activities, and for indirect provision of more employment opportunities through impacts on the supply chain resulting from increased electricity supply.	• Potential for short-term temporary disruption of the local population due to potential for increased traffic during the maintenance phase. • Potential for long-term health and safety impacts with interactions between transmission infrastructure and settlements. • Potential for risk of death or serious injury with interactions with cables e.g., damaged cables (HSE, 2023)[95]. • Potential for Electromagnetic Field (EMF) risk from electricity transmission lines or perceived risk. Burial reduces the electric fields, but magnetic fields are less reduced by this, potential evidence from epidemiological studies of increased risk of childhood leukaemia with exposure to increased magnetic fields (Danby, 2012)[96].
		Geology, Soils and Land Use	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary direct loss / disturbance, compaction or mobilisation of soils, including sensitive soils, along the transmission route during construction of trenches, and along access routes. • Potential for short-term contamination of soils / geological features by cement or fuel spills during the construction phase, or the accidental transfer of materials along the

[95] https://www.hse.gov.uk/electricity/underground.htm

[96] Danby, G. (2012). Underground power lines and health. House of Commons Library. SNSC-06453.

			transmission route corridor where projects interact with contaminated sites. • Potential for difficult construction conditions where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines). • Potential for soil movement through shear failure, erosion, or wash-out of fine materials, potential for watercourse sedimentation and siltation during construction phase, particularly when compaction increases the runoff potential through reduced soil permeability. Potential can be enhanced if coincides with bad weather events (EirGrid, 2016)[97]. • Potential for topography to influence the degree of risk to construction processes.
		Operational Phase	
		• None anticipated.	• Potential for difficult working conditions for maintenance where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines). • Cables must have adequate design to withstand soil thermal resistance, particularly in dry soils to avoid potential heat dissipation to soils (Salata et al., 2015)[98]. • Potential for long-term soil loss if inappropriate infrastructure site management in terms of revegetation rates (EirGrid, 2016)[99]. • Potential for a permanent loss of forest along the transmission route due to variety of ground conditions covered.
		Water	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary direct or indirect effects on water quality from siltation due to soil loss, pollution or

[97] EirGrid. (2012). Ecology Guidelines for Electricity Transmission Projects. A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects.

[98] https://doi.org/10.1016/j.applthermaleng.2014.12.059

[99] RPS Group 2016. EirGrid Evidence Based Environmental Studies Study 7: Soils and Geology. Literature review and evidence based field study on the effects of high voltage transmission development on soils and geology.

			damage to riverbanks and riparian habitats during the construction phase. • Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal). • Potential for effects on WFD status of surface or marine waterbodies during construction and effects on status of WFD protected areas. • Potential for increased damages when coincides with bad weather events.
		Operational Phase	
		• None anticipated.	• Potential for difficult working conditions during maintenance periods when bad weather events occur limiting access.
		Air	
		Installation / Construction Phase	
		• None anticipated	• Potential for short-term temporary, localised increases in air pollution (including ambient PM_{10} and nitrogen dioxide emissions) from plant emissions during construction, and a reduction in local air quality including in sensitive areas (AQMAs). • Potential for associated short-term secondary negative effects on climatic factors, human health and biodiversity. • Potential for short-term temporary, localised dust deposition and visible plumes, resulting from trench excavation and ground movement and influenced by the ambient weather conditions.
		Operational Phase	
		• Potential for a reduction in air pollutant emissions from power stations in the medium- to long-term owing to the facilitation of new renewable energy connections.	• Potential for short-term temporary increases in air pollution from plant emissions during maintenance activities.
		Climatic Factors	
		Installation / Construction Phase	
		• None anticipated.	• Potential for temporary, short to medium-term loss (e.g., peatland, grassland) of GHG sequestering natural cover.

			• Potential for difficult working conditions where projects interact with areas of climate change induced flood risk (fluvial, pluvial or coastal). • Potential for effects on climate resilience of localised areas and climate changes altering the resilience of installed infrastructure, with potential for influencing degradation rates with secondary impacts on pollution and biodiversity (Jones and McManus, 2010)[100]. • Potential for short-term temporary, localised increases in GHG emissions from the use of construction equipment during construction and decommissioning activities.
		Operational Phase	
		• Potential for positive effects on GHG emissions in the medium to long-term owing to the facilitation of new renewable energy connections.	• Potential for permanent loss (e.g., forest) of GHG sequestering natural cover. • Potential for short-term temporary, localised increases in GHG emissions during maintenance activities.
		Material Assets	
		Installation / Construction Phase	
		• None anticipated	• Potential for short-term temporary, direct effects during the construction phase on power supply. • Potential for short-term temporary, direct effects during the construction phase on local road networks or other transport infrastructure in the vicinity due to construction-related traffic. • Potential for short-term temporary planning and construction constraints due to the presence of pipelines / existing electrical infrastructure. • Potential for short-term, temporary, direct disturbance impacts, such as loss of crops, to agricultural land during the construction phase. • Potential for negative impacts on fisheries from pollution or siltation of watercourses from construction phase (EirGrid, 2012)[3].
		Operational Phase	

[100] https://doi.org/10.1016/j.jclepro.2010.05.008

		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium- to long-term.	• Potential for short-term temporary effects during maintenance phases on power supply or on local transport infrastructure.
		Cultural, Archaeological and Architectural Heritage	
		Installation / Construction Phase	
		• Potential for the discovery of new cultural heritage features during construction phases or during potential site surveys.	• Potential for discovery / damage to unknown archaeological or unmarked burial features from trenching during the construction. • Potential for short-term direct or indirect effects on local heritage assets, and short-term effects on the setting of heritage assets during the construction phase due to excavation of large, linear trenches phase.
		Operational Phase	
		• None anticipated.	• Potential for long-term direct or indirect effects on local heritage assets, (underground cabling is not expected to have any potential to affect the setting of heritage assets post-construction).
		Landscape and Visual Amenity	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary effects on the local landscape and views during the construction phase, including within sensitive areas.
		Operational Phase	
		• None anticipated.	• Maintenance phases may impact views with return of machinery to sensitive areas to facilitate cable access,
New Transmission Lines: **Overhead Transmission Lines**	Conductors are supported on steel lattice towers or wooden pole sets. Towers require foundation blocks of varying size (depending on the design and the voltage supported). Concreting is not typically needed around the base of wooden pole sets, however, stay blocks / wooden sleepers are used for support. Towers / pole	***Biodiversity, Flora and Fauna***	
		Installation / Construction Phase	
		• None anticipated.	• Potential for direct temporary construction phase disturbance to permanent loss of designated or non-designated habitats and species in the footprint of these works, or along access routes during construction and maintenance. • Potential for short-term temporary construction-phase disturbance of fauna, including birds, in the vicinity of the works during construction and maintenance activities.

	sets are required along the route corridor at varying spans, as detailed in Section 2.4.1.		• Potential for the introduction or spread of invasive non-native species during the construction phase. • Potential for direct temporary construction phase disturbance causing habitat fragmentation with potential long-term effects depending on infrastructure layout. • Potential for construction to increase the risk of fire within the vicinity of the transmission corridor in the short-, medium-, and long-term. • Potential for long-term direct effects on birds from death or injury through collision, primarily with top thin line on powerlines and / or electrocution with overhead lines with a potential loss of species. Potential for collision and electrocution risk to be increased in transmission sites adjacent to wetlands due to waterfowl species being more susceptible.
		Operational Phase	
		• None anticipated	• Potential for medium- to long-term effects on wetland habitats should foundation works lead to a change in hydrological conditions. • Potential for short-term temporary disturbance of fauna, including birds, in the vicinity of the works during maintenance activities particularly with tree or scrub clearing works (EirGrid, 2012)[3]. • Potential for long-term indirect impacts through transmission facilities altering natural relationships and competitive balances (CIGRE, 2003)[101]. • Potential for long-term impacts on birds through habitat exclusion and avoidance of infrastructure areas during migrations or foraging activities. • Potential for the operation of transmission infrastructure to increase the risk of fire within the vicinity of the transmission corridor in the short, medium and long-term. • Potential for long-term direct effects on birds from death or injury through collision and / or electrocution with overhead

[101] CIGRE (2003) Environmental impacts of grid interconnection. Cigre Publication

			lines with a potential loss of species (BirdLife International, 2007)[102].
		Population and Human Health	
		Installation / Construction Phase	
		• Potential for short- to long-term, temporary to permanent increased employment opportunities from construction activities.	• Potential for short-term temporary and localised disturbance from noise and dust during the construction-phase, including the potential for disturbance in socially sensitive areas. • Potential for short-term temporary disruption of the local population due to increased construction traffic during the construction phase.
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium- to long-term. • Potential for short- to long-term, temporary to permanent increased employment opportunities from maintenance activities, and for indirect provision of more employment opportunities through impacts on the supply chain resulting from increased electricity supply.	• Potential for new infrastructure to pose a local physical constraint on development in the medium- to long-term, particularly when poorer coexistence levels between transmission infrastructure and buildings for rural areas compared to higher coexistence levels for urban areas. • Construction and operation of permanent structures such as transmission lines could have potential to lead to cumulative negative effects on already deprived and socially sensitive areas in the medium- to long-term. • Potential to reduce ability of people to enjoy open air recreation due to intrusion or route obstruction from the presence of transmission infrastructure.
		Geology, Soils and Land Use	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary direct loss / disturbance, compaction or mobilisation of soils, including sensitive soils, along access routes. • Potential for short-term contamination of soils / geological features by cement or fuel spills during the construction phase, or the accidental transfer of materials along the transmission route corridor where projects interact with contaminated sites.

[102] BirdLife International (2007). Position Statement on birds and Power lines: on the risks to birds from transmission facilities and how to minimise any such adverse effect.

			• Potential for watercourse degradation through siltation and sedimentation, particularly when compaction increases the runoff potential through reduced soil permeability. Potential can be enhanced if coincides with bad weather events (EirGrid, 2016)[5]. • Potential for difficult working conditions where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines).
		Operational Phase	
		• None anticipated	• Potential for direct permanent loss of soils / land use, including sensitive soils, in the footprint of wooden pole sets / foundations for lattice steel towers. • Potential for difficult working conditions where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines), particularly during maintenance activities if this coincides with bad weather. • Potential for a permanent loss of forest along the OHL transmission route.
		Water	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary direct or indirect effects on water quality from siltation due to soil loss, pollution or damage to riverbanks during the construction phase. • Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal).
		Operational Phase	
		• None anticipated.	• Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal) during maintenance activities particularly if this coincides with poor weather conditions. • Potential for pollutants to arise from transmission infrastructure of concrete and hydrocarbons based in tower foundations and culverts.
		Air	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary, localised increases in air pollution (including ambient PM_{10} and nitrogen dioxide

			emissions) from plant emissions during construction and maintenance activities, and a reduction in local air quality including in sensitive areas (AQMAs). • Potential for associated short-term secondary negative effects on climatic factors, human health and biodiversity. • Potential for short-term temporary, localised dust generation, deposition and visible plumes, resulting from ground movement and influenced by the ambient weather conditions.
		Operational Phase	
		• Potential to contribute to a reduction in air pollutant emissions from power stations in the medium- to long-term owing to the facilitation of new renewable energy connections.	• Potential for short-term temporary, localised increases in air pollution and noise during maintenance activities.
		Climatic Factors	
		Installation / Construction Phase	
		• None anticipated	• Potential for short-term temporary, localised increases in GHG emissions from the use of construction equipment during construction and decommissioning activities.
		Operational Phase	
		• Potential to contribute to positive effects on GHG emissions in the medium- to long-term owing to the facilitation of new renewable energy connections.	• Potential for direct permanent loss in the footprint of wooden pole sets / foundations for lattice steel towers, and for temporary, short to medium-term loss in the vicinity of the works or along access routes (e.g., peatland, grassland) to permanent loss (e.g., forest) along the transmission route corridor, of GHG sequestering natural cover. • Potential for difficult working conditions where projects interact with areas of climate change induced flood risk (fluvial, pluvial or coastal). • Potential for short-term temporary, localised increases in GHG emissions from the use of construction equipment during construction, maintenance and decommissioning activities.
		Material Assets	
		Installation / Construction Phase	

		• None anticipated.	• Potential for short-term temporary, direct effects during the construction phase on power supply. • Potential for short-term temporary, direct effects during the construction phase on local road networks or other transport infrastructure in the vicinity due to construction-related traffic. • Potential for short-term temporary planning and construction constraints due to the presence of pipelines / existing electrical infrastructure. • Potential for short-term, temporary, direct disturbance impacts, such as loss of crops, to agricultural land during the construction phase. • Potential for negative impacts on fisheries from pollution or siltation of watercourses from construction phase (EirGrid, 2012)[3].
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium- to long-term.	• Potential for short-term temporary, direct effects during maintenance periods on the power supply.
		Cultural, Archaeological and Archaeological Heritage	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short- to long-term direct or indirect effects on local heritage assets during the construction phase • Potential for short-term effects on the setting of heritage assets during the construction phase.
		Operational Phase	
		• None anticipated.	• Potential for permanent effects on the setting of heritage assets post-construction.
		Landscape and Visual Amenity	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary effects on the local landscape and views during the construction phase, including within sensitive areas.
		Operational Phase	
		• None anticipated.	• Potential for long-term permanent effects on local landscape character and visual amenity from the addition

			of new structures (steel lattice towers, wooden pole sets, overhead line) to the area, including in sensitive landscape character areas. • Potential for visual intrusions from transmission infrastructure on views from properties, roads, recreational and tourist area (SPEN, 2020)[103].
Transmission Line Restring or Uprate	Refurbishment comprises replacement of towers, pole sets, insulators or hardware at selected locations and the replacement or strengthening of selected angle tower foundations. Works may consist of a major overhaul of equipment, to rebuild or replace parts or components of a transmission asset. Existing transmission lines can also be uprated to increase capacity or strengthen electrical resilience in the system. This involves replacement of the OHL conductor with a more efficient conductor of the same voltage and usually involves replacement of a significant number of support structures.	***Biodiversity, Flora and Fauna***	
		Installation / Construction Phase	
		• None anticipated.	• Potential for direct temporary construction phase disturbance to permanent loss of designated or non-designated habitats and species in the footprint of these works where new supporting structures are required, or along access routes during construction. • Potential for short-term temporary construction-phase disturbance of fauna, including birds, in the vicinity of the works during construction and maintenance activities. • Potential for the introduction or spread of invasive non-native species during the construction phase. • Potential for construction of transmission infrastructure to increase the risk of fire within the vicinity of the transmission corridor in the short, medium and long-term.
		Operational Phase	
		• None anticipated.	• Potential for direct temporary maintenance phase disturbance to permanent loss of designated or non-designated habitats and species in the footprint of these works where new supporting structures are required, or along access routes. • Potential for medium- to long-term effects on wetland habitats should foundation works lead to a change in hydrological conditions. • Potential for continued long-term direct effects on birds from death or injury through collision and / or electrocution with overhead line.

[103] SPEN. (2020). Approach to Routeing and Environmental Impact Assessment. SP Energy Networks.

			• Potential for operation of transmission infrastructure to increase the risk of fire within the vicinity of the transmission corridor in the short, medium and long-term.
		Population and Human Health	
		Installation / Construction Phase	
		• Potential for short-term, temporary to permanent increased employment opportunities from construction activities.	• Potential for short-term temporary and localised disturbance from noise and dust during the construction phase, including the potential for disturbance in socially sensitive areas. • Potential for short-term temporary disruption of the local population due to increased construction traffic during the construction phase.
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium to long-term. • Potential for long-term, temporary to permanent increased employment opportunities from maintenance activities, and for indirect provision of more employment opportunities through impacts on the supply chain resulting from increased electricity supply.	• Potential for short-term temporary disruption of the local population due to increased dust and noise during maintenance phases.
		Geology, Soils and Land Use	
		Installation / Construction Phase	
		• None anticipated.	• Potential for direct permanent loss of soils / land use, including sensitive soils, in the footprint of wooden pole sets / foundations for lattice steel towers, where new structures are required. • Potential for short-term temporary direct loss / disturbance, compaction or mobilisation of soils, including sensitive soils, along access routes. • Potential for short-term contamination of soils / geological features by cement or fuel spills during the construction phase, or the accidental transfer of materials along the transmission route corridor where projects interact with contaminated sites. Potential for watercourse degradation through siltation and sedimentation, particularly when compaction increases the runoff potential through reduced

			soil permeability. Potential can be enhanced if coincides with bad weather events (EirGrid, 2016)[5]. • Potential for difficult working conditions where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines).
		Operational Phase	
		• None anticipated.	• Potential for difficult working conditions where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines) for maintenance activities.
		Water	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary direct or indirect effects on water quality from siltation due to soil loss, pollution or damage to riverbanks during the construction phase. • Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal).
		Operational Phase	
		• None anticipated.	• Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal) during maintenance activities.
		Air	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary, localised increases in air pollution (including ambient PM_{10} and nitrogen dioxide emissions) from plant emissions during construction, and a reduction in local air quality including in sensitive areas (AQMAs). • Potential for associated short-term secondary negative effects on climatic factors, human health and biodiversity. • Potential for short-term temporary, localised dust deposition and visible plumes, resulting from ground movement and influenced by the ambient weather conditions.
		Operational Phase	
		• Potential to contribute to a reduction in air pollutant emissions from power stations in the medium- to	• Potential for short-term temporary, localised increases in air pollution (including ambient PM_{10} and nitrogen dioxide

		long-term owing to the facilitation of new renewable energy connections.	emissions) from plant emissions during maintenance activities and a reduction in local air quality including in sensitive areas (AQMAs). • Potential for noise generation i.e., audible “Corona Noise” from high voltage transmission lines and “Aeolian Noise” whereby wind blowing through electricity infrastructure generates noise.
		Climatic Factors	
		Installation / Construction Phase	
		• None anticipated.	• Potential for direct permanent loss in the footprint of any new required wooden pole sets / foundations for lattice steel towers / temporary, short to medium term loss in the vicinity of the works or along access routes, of GHG sequestering natural cover (e.g., peatland, forests). • Potential for difficult working conditions where projects interact with areas of climate change induced flood risk (fluvial, pluvial or coastal). • Potential for short-term temporary, localised increases in GHG emissions from the use of construction equipment during construction and decommissioning activities.
		Operational Phase	
		• Potential to contribute to positive effects on GHG emissions in the medium- to long-term owing to the facilitation of new renewable energy connections.	• Potential for short-term temporary, localised increases in GHG emissions from the use of equipment during maintenance activities.
		Material Assets	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary, direct effects during the construction phase on power supply. • Potential for short-term temporary, direct effects during the construction phase on local road networks or other transport infrastructure in the vicinity due to construction-related traffic. • Potential for short-term, temporary, direct disturbance impacts, such as loss of crops, to agricultural land during the construction phase.
		Operational Phase	

		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium- to long-term.	• Potential for short-term temporary, direct effects during the maintenance phase on power supply • Potential for short-term temporary, direct effects during maintenance phases on local road networks or other transport infrastructure in the vicinity.
		Cultural, Archaeological and Architectural Heritage	
		Installation / Construction Phase	
		• Potential for the discovery of new cultural heritage features during construction phases or during potential site surveys.	• Potential for short- to long-term direct or indirect effects on local heritage assets during the construction phase including destruction or damage to archaeological features or unmarked burials during construction phase. • Potential for short-term effects on the setting of heritage assets during the construction phase.
		Operational Phase	
		• None anticipated.	• Potential for long-term direct or indirect effects on local heritage assets during the operational phase.
		Landscape and Visual Amenity	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary effects on the local landscape and views during the construction phase, including within sensitive areas.
		Operational Phase	
		• None anticipated.	• Potential for long-term permanent effects on the local landscape and views during operational and maintenance phases. • Potential for visual intrusions from transmission infrastructure on views from properties, roads, recreational and tourist area (SPEN, 2020)[9].
New Substation	Substations connect two or more transmission lines, taking electricity from the	***Biodiversity, Flora and Fauna***	
		Installation / Construction Phase	

	transmission lines and transforming higher to lower voltage, or vice versa. Contain various electrical equipment, including voltage switches, transformers, protection equipment, and associated lines and cabling. Substations can be of two types: • Air Insulated Switchgear (AIS) substations (infrastructure is primarily installed outdoors) require a relatively large compound footprint. • Gas Insulated Switchgear (GIS) substations (electrical equipment contained internally, in buildings of typically 11 m to 13 m height) require a significantly smaller substation footprint. Substations also require access roads off / onto the public road network; provision of associated electrical equipment and infrastructure (including underground cables); surface water drainage infrastructure from buildings and other substation elements; ancillary wastewater treatment facilities; palisade fencing around boundaries; and	• None anticipated.	• Potential for direct temporary construction phase disturbance to designated or non-designated habitats and species in the footprint of the new substation, or along access routes during construction. • Potential for short-term temporary construction-phase disturbance of fauna, including birds, in the vicinity of the works, and indirect effects on downstream water-dependent habitats / species via sedimentation / pollution during construction. • Potential for the introduction or spread of invasive non-native species during the construction phase. • Potential for construction of transmission infrastructure to increase the risk of fire within the vicinity of the substation in the short, medium and long-term.
		Operational Phase	
		• None anticipated	• Potential for direct temporary maintenance phase disturbance to permanent loss of designated or non-designated habitats and species in the footprint of the new substation, or along access routes during maintenance. • Potential for operation of transmission infrastructure to increase the risk of fire within the vicinity of the substation in the short, medium and long-term.
		Population and Human Health	
		Installation / Construction Phase	
		• Potential for short-term, temporary to permanent increased employment opportunities from construction activities.	• Potential for short-term temporary and localised disturbance from noise and dust during the construction-phase, including the potential for disturbance in socially sensitive areas. • Potential for short-term temporary disruption of the local population due to increased construction traffic during the construction phase.
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium to long-term. • Potential for short- to long-term, temporary to permanent increased employment opportunities from maintenance activities, and for indirect	• Potential for new infrastructure to pose a local physical constraint on development in the medium- to long-term. • Potential for medium to long-term operational noise impacts to the local population in the vicinity of new substations.

	other site development and landscaping works.	provision of more employment opportunities through impacts on the supply chain resulting from increased electricity supply.	• Presence and operation of permanent structures such as substations could have potential to lead to cumulative negative effects on already deprived and socially sensitive areas in the medium- to long-term. • Potential for long-term light pollution, particularly if substations are located near residential areas and these use lights operating all night to deter vandalism (Gogan and Wyckoff, 2012)[104]. Potential for long-term lighting to impact enjoyment of night-sky in rural areas (Gogan and Wyckoff, 2012).
		Geology, Soils and Land Use	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary direct loss / disturbance, compaction or mobilisation of soils, including sensitive soils, along access routes. • Potential for short-term contamination of soils / geological features by cement or fuel spills during the construction phase, or the accidental transfer of materials where projects interact with contaminated sites. Potential for watercourse degradation through siltation and sedimentation, particularly when compaction increases the runoff potential through reduced soil permeability. Potential can be enhanced if coincides with bad weather events (EirGrid, 2016)[5]. • Potential for difficult working conditions where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines).
		Operational Phase	
		• None anticipated.	• Potential for direct permanent loss of soils / land use, including sensitive soils, in the footprint of the substation site. • Potential for difficult working conditions where projects interact with areas of difficult ground conditions (e.g., unstable ground, steep slopes, mines) during maintenance activities.

[104] https://doi.org/10.1109/TDC.2012.6281717

		Water	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary direct or indirect effects on water quality from siltation due to soil loss, pollution or damage to riverbanks during the construction phase. • Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal).
		Operational Phase	
		• None anticipated.	• Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal) during maintenance or operational phases.
		Air	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary, localised increases in air pollution (including ambient PM_{10} and nitrogen dioxide emissions) from plant emissions during construction activities, and a reduction in local air quality including in sensitive areas (AQMAs). • Potential for short-term temporary, localised noise effects during the construction phase.
		Operational Phase	
		• Potential to contribute to a reduction in air pollutant emissions from power stations in the medium to long-term owing to the facilitation of new renewable energy connections.	• Potential for short-term temporary, localised increases in air pollution (including ambient PM_{10} and nitrogen dioxide emissions) from plant emissions during maintenance activities, and a reduction in local air quality including in sensitive areas (AQMAs). • Potential for associated short-term secondary negative effects on climatic factors, human health and biodiversity. • Potential for medium to long-term operational noise impacts in the vicinity of new substations. • Potential for short-term temporary, localised dust deposition and visible plumes, resulting from ground movement and influenced by the ambient weather conditions.
		Climatic Factors	
		Installation / Construction Phase	

		• None anticipated.	• Potential for direct permanent loss in the footprint of the new substation, short to medium-term loss in the vicinity of the works or along access routes, of GHG sequestering natural cover (e.g., peatland, forests). • Potential for difficult working conditions where projects interact with areas of climate change induced flood risk (fluvial, pluvial or coastal). • Potential for short-term temporary, localised increases in GHG emissions from the use of construction equipment during construction and decommissioning activities.
		Operational Phase	
		• Potential to contribute to positive effects on GHG emissions in the medium- to long-term owing to the facilitation of new renewable energy connections	• Potential for direct permanent loss in the footprint of the new substation, in the vicinity of the works or along access routes, of GHG sequestering natural cover (e.g., peatland, forests). • Potential for difficult working conditions where projects interact with areas of climate change induced flood risk (fluvial, pluvial or coastal) during operational and maintenance phases. • Potential for short-term temporary, localised increases in GHG emissions during maintenance activities.
		Material Assets	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary, direct effects during the construction phase on power supply. • Potential for short-term temporary, direct effects during the construction phase on local road networks or other transport infrastructure in the vicinity due to construction-related traffic. • Potential for direct permanent loss of agricultural land in the footprint of the new substation, and short-term, temporary direct disturbance impacts, such as loss of crops, to agricultural land in the vicinity of the works or along access routes during the construction phase.
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium- to long-term.	• Potential for short-term temporary, direct effects during maintenance on power supply. • Potential for substation noise to impact on wireless communication systems.

		Cultural, Archaeological and Architectural Heritage	
		Installation / Construction Phase	
		• Potential for discovery of previously unknown cultural heritage features in chosen site.	• Potential for short- to long-term direct or indirect effects on local heritage assets during the construction phase. • Potential for short-term effects on the setting of heritage assets during the construction phase. • Potential for the damage to unknown archaeological features or unmarked burials within the footprint of the new substation during the construction phase.
		Operational Phase	
		• None anticipated.	• Potential for permanent effects on the setting of heritage assets post-construction.
		Landscape and Visual Amenity	
		Installation / Construction Phase	
		• None anticipated.	• Potential for short-term temporary effects on the local landscape and views during the construction phase, including within sensitive areas.
		Operational Phase	
		• None anticipated.	• Potential for long-term permanent effects on local landscape / seascape character and visual amenity from the addition of new structures to the area, including in sensitive landscape character areas. • Potential for visual intrusions from transmission infrastructure on views from properties, roads, recreational and tourist area (SPEN, 2020)[9].
Substation Upgrade	Redevelopment of the existing substation or replacement. This may involve an extension to the footprint of the substation site.	***Biodiversity, Flora and Fauna***	
		Installation / Construction Phase	
		• None anticipated.	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to short-term temporary construction phase disturbance of fauna, including birds, in the vicinity of the works, and indirect effects on downstream water-dependent habitats / species via sedimentation / pollution during construction.
		Operational Phase	
		• None anticipated.	• Where the substation is expanded, potential impacts are likely to be as for new substations (described above), albeit at a smaller scale.

		Population and Human Health	
		Installation / Construction Phase	
		• Potential for short- to long-term, temporary to permanent increased employment opportunities from construction activities, and for indirect provision of more employment opportunities through impacts on the supply chain resulting from increased electricity supply.	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to short-term temporary and localised disturbance from noise and dust during the construction-phase, including the potential for disturbance in socially sensitive areas, and short-term temporary disruption of the local population due to increased construction traffic during the construction phase.
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium- to long-term.	• Where the substation is expanded, potential impacts are likely to include the above, as well as potential effects in the medium- to long-term as described for new substations. • Potential for long-term light pollution, particularly if substations are located near residential areas and these use lights operating all night to deter vandalism (Gogan and Wyckoff, 2012)[10]. Potential for long-term lighting to impact enjoyment of night-sky in rural areas (Gogan and Wyckoff, 2012).
		Geology, Soils and Land Use	
		Installation / Construction Phase	
		• None anticipated.	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to temporary direct loss / disturbance, compaction or mobilisation of soils and short-term contamination of soils / geological features by cement or fuel spills during the construction phase. Potential for watercourse degradation through siltation and sedimentation, particularly when compaction increases the runoff potential through reduced soil permeability. Potential can be enhanced if coincides with bad weather events (EirGrid, 2016)[5].
		Operational Phase	
		• None anticipated.	• Where the substation is expanded, potential impacts are likely to be as for new substations (described above), albeit at a smaller scale.
		Water	
		Installation / Construction Phase	

		• None anticipated.	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to short-term temporary direct or indirect effects on water quality from siltation due to soil loss, or pollution during the construction phase. • Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal) during construction activities.
		Operational Phase	
		• None anticipated.	• Where the substation is expanded, potential impacts are likely to include the above. • Potential for difficult working conditions where projects interact with areas of flood risk (fluvial, pluvial or coastal) during operational and maintenance activities.
		Air	
		Installation / Construction Phase	
		• None anticipated	• Potential for short-term temporary, localised increases in air pollution (including ambient PM_{10} and nitrogen dioxide emissions) from plant emissions during construction and maintenance activities, and a reduction in local air quality including in sensitive areas (AQMAs). • Potential for short-term temporary, localised noise effects during the construction phase. • Potential for short-term temporary, localised dust deposition and visible plumes, resulting from ground movement and influenced by the ambient weather conditions.
		Operational Phase	
		• Potential to contribute to a reduction in air pollutant emissions from power stations in the medium- to long-term owing to the facilitation of new renewable energy connections.	• Potential for associated short-term secondary negative effects on climatic factors, human health and biodiversity • Potential for short-term temporary, localised noise effects during the construction phase.
		Climatic Factors	
		Installation / Construction Phase	
		• None anticipated	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to short-term temporary, localised increases in GHG

			emissions from the use of construction equipment during construction activities. • Potential for difficult working conditions where projects interact with areas of climate change induced flood risk (fluvial, pluvial or coastal) during construction. • Where the substation is expanded, potential impacts are likely to include the above.
		Operational Phase	
		• Potential to contribute to positive effects on GHG emissions in the medium- to long-term owing to the facilitation of new renewable energy connections.	• Potential for direct permanent loss in the footprint of the substation expansion, short- to medium-term loss in the vicinity of the works or along access routes, of GHG sequestering natural cover (e.g., peatland, forests). • Potential for difficult working conditions where projects interact with areas of climate change induced flood risk (fluvial, pluvial or coastal) during operations and maintenance activities.
		Material Assets	
		Installation / Construction Phase	
		• None anticipated.	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to short-term temporary, direct effects during the construction phase on power supply and on local road networks or other transport infrastructure in the vicinity due to construction-related traffic. • Potential for short-term, temporary direct disturbance impacts, such as loss of crops, to agricultural land in the vicinity of the works or along access routes during the construction phase. • Where the substation is expanded, potential impacts are likely to include the above. • Potential for substation noise to impact on wireless communication systems.
		Operational Phase	
		• Potential to facilitate an increased supply of secure and reliable energy, including renewable energy, in the medium to long-term.	• Potential for direct permanent loss of agricultural land in the footprint of the expanded substation.
		Cultural, Archaeological and Architectural Heritage	
		Installation / Construction Phase	

		• Potential for discovery of new cultural heritage features with construction works during line uprating or refurbishment.	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to short-term temporary effects on the setting of heritage assets during the construction phase. Potential effects can extend to the access road areas for the substations. • Where the substation is expanded, potential impacts are likely to include the above. • Potential for medium- to long-term direct or indirect effects on local heritage assets during the construction phase. • Potential for the discovery / damage to unknown archaeological features or unmarked burials within the footprint of extended substation during the construction phase.
		Operational Phase	
		• None anticipated.	• Potential for permanent effects on the setting of heritage assets post-construction. • Potential for further disturbance or damage to areas of significance with line uprating or refurbishment.
		Landscape and Visual Amenity	
		Installation / Construction Phase	
		• None anticipated.	• Where redevelopment is within the footprint of the existing substation, potential impacts are likely to be limited to short-term temporary effects on the local landscape and views during the construction phase, including within sensitive areas.
		Operational Phase	
		• None anticipated.	• Where the substation is expanded, there is potential for exacerbation of long-term permanent effects of the existing substation on local landscape / seascape character and visual amenity from the expansion of the site / addition of new structures to the area, including in sensitive landscape character areas. • Potential for visual intrusions from transmission infrastructure on views from properties, roads, recreational and tourist area (SPEN, 2020)[9].

7.2 Assessment of potential TDPNI Options

The following section provides a quantitative and qualitative assessment of the proposed options / alternatives available to the TDPNI 2023-2032. The development options are scored against the SEOs given in **Table 5-2**. The scoring guidelines used for this assessment can be found in **Appendix C** of this report. Following scoring of the option against these SEOs there is a wider commentary on potential impacts by environmental topic area, which is included as **Appendix D** of this report. Note that while the SEA has refined options, where possible, by using constraints modelling to define areas of lower sensitivity within the study areas for development options comprising new transmission lines or substations, the HRA has taken a precautionary approach based on the individual project descriptions and the potential linkages identified with European sites.

7.2.1 Moyle Interconnector Capacity Increase – Project 1

Moyle Interconnector Capacity Increase – New Transmission Line Cabling

At present, full utilisation of the 500 MW export capability of the Moyle Interconnector is prevented by the potential for network overloads and voltage steps in the event of the loss of the 275 kV double circuit between the Moyle converter station at Ballycronan More and the nearby Ballylumford substation. This project involves works to allow reconfiguration of the connection to Moyle to address this contingency.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – The study area crosses one SPA, namely Larne Lough SPA. The study area crosses one RAMSAR site, namely Larne Lough RAMSAR site. The study area crosses one ASSI, namely Larne Lough ASSI.

Population & Human Health - There are no main settlements within the study area. The mean population density of this study area is 0.02 people / km^2; this is low in comparison to other study areas. Within the study area there are no peace lines, Neighbourhood Renewal Areas or areas of lower perceived health.

Geology, Soils & Land Use – The study area covers approximately 1.5 km^2 and is composed mainly of broadleaf woodland (18%), arable land (54%), coastal land (13%) and urban land (6%). The study area encompasses no ASSI sites of geological heritage. Within the study area there is one abandoned mine located at Ferris Bay Road. There are no areas of unstable ground areas identified within the study area. There are no ancient and long-established woodland areas or Forest Service sites in the study area. Within the study area there is one PPC site (AES Ballylumford-Ballylumford Power Station) located at Ferris Bay Road, and four historical sites (power station, dockyards / docklands and mineral workings) which have the potential of being contaminated land located along the coastline / Ballylumford Road. There is also a known abandoned mine workings within the area. The study area includes no upland and steep slope areas.

Water – Within the study area there are no WFD river water bodies, however there is one section of river water body that transects the area (UKGBNI8NE003). There are two transitional / coastal water bodies within the study area of Larne Lough Mid (moderate status) and Larne Lough North (MEP status). Within the study area there are no drinking water rivers. Larne Lough has been identified as a flood risk area. This flood risk area could become inundated and lead to difficult working conditions during the installation of the new transmission line. There are no regions with significant areas of 1% AEP fluvial flood risk within the study area. Within the study area there is one significant area of 0.5% AEP coastal flood risk in the south-west, namely Larne Lough and the surrounding coastline. There are several areas with significant 0.5% AEP pluvial flood risk mainly scattered throughout the west study area, located to the north and south of the Ballylumford Road.

Air – There are no AQMAs or other known significant air quality issues within the study area.

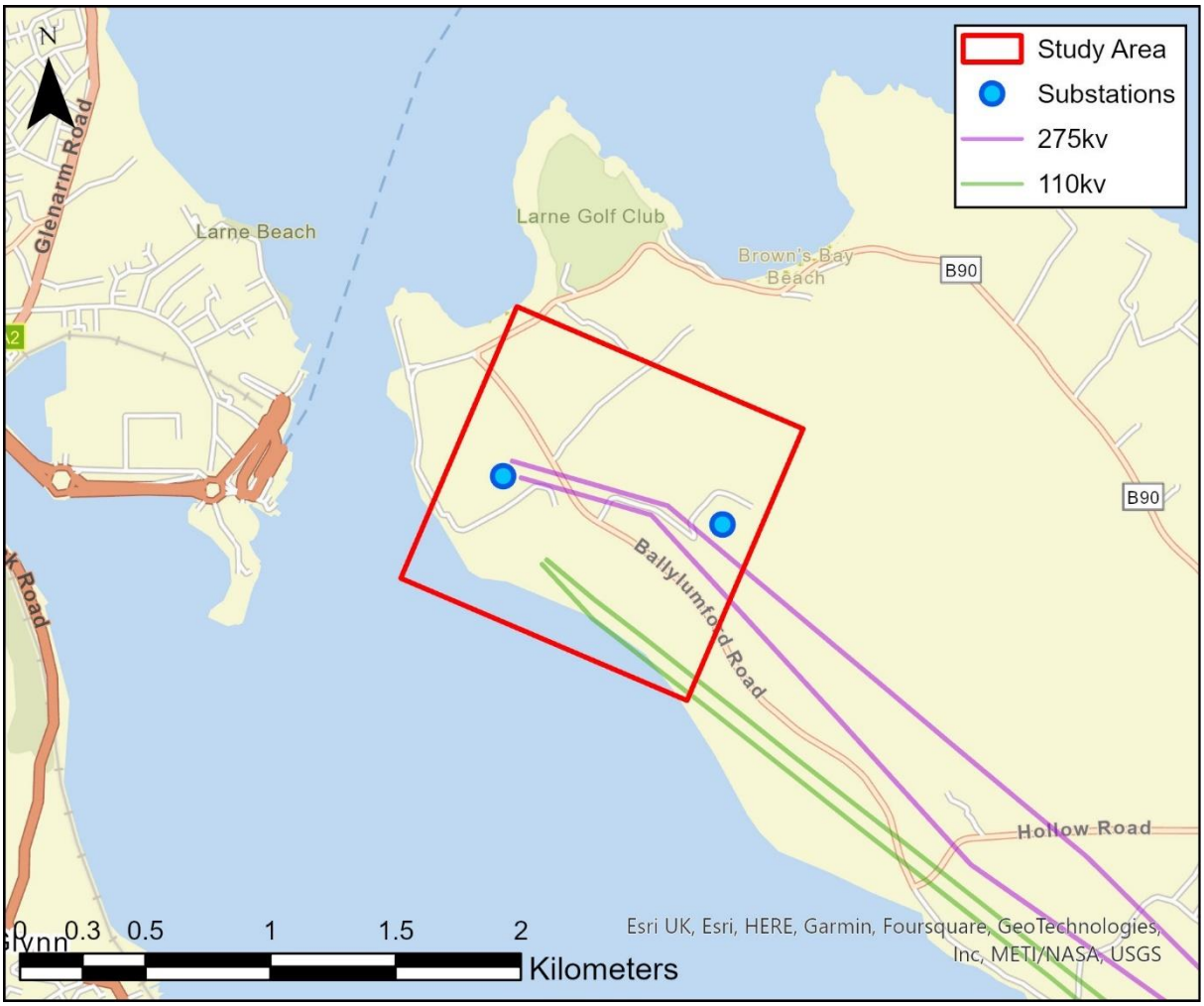
Climatic Factors – There is one significant area of 0.5% AEP climate change coastal flood risk in the south of the study area, namely Larne Lough and the surrounding coastline. There are several areas with significant 0.5% AEP climate change pluvial flood risk mainly scattered throughout the west study area, located to the north and south of the Ballylumford Road.

Material Assets – There are 1.57 km of B Class roads within the study area. There is one existing gas transmission line (PNG Transmission), and four electricity transmissions lines, of which two are 110 kV OHLs and two are 275 kV OHLs. Within the study are there is 0.615 km^2 of agricultural land, which is entirely comprised of pastures.

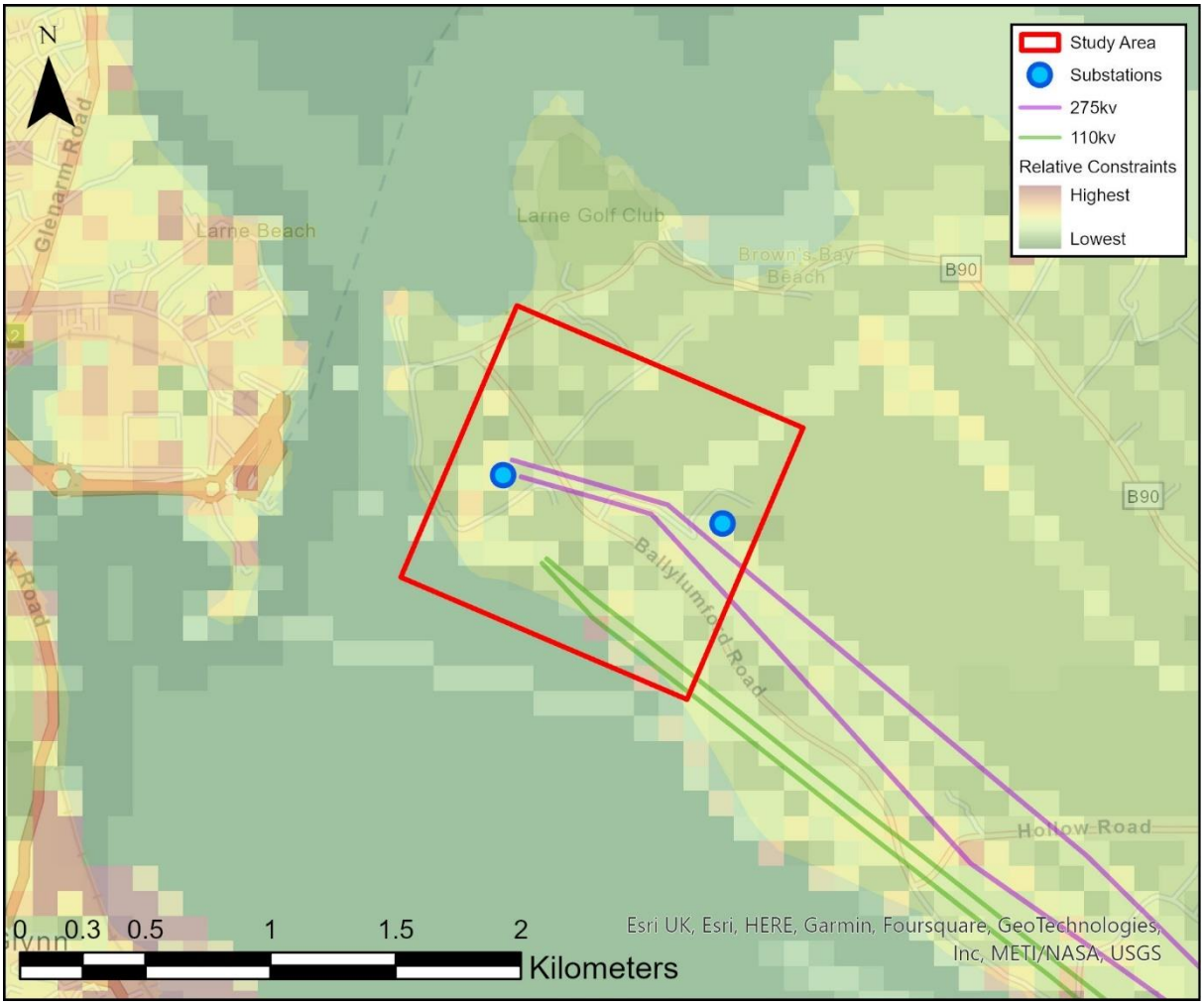
Cultural, Architectural & Archaeological Heritage – Within the study area there are six SMR sites (standing stones, Ballylumford Dolmen, findspot of Torcs, findspot of gold ornaments, and findspot of an armlet) and no Scheduled Zones. There are two Listed buildings within the study area, being Druid's Cottage and a Cottage at 10 Quarterland Road, and two IHR sites (landing site and a pier).

Landscape & Visual Amenity – The study area crosses one LCA, namely the Island Magee LCA, which is designated as a High Sensitivity area.

Study Area

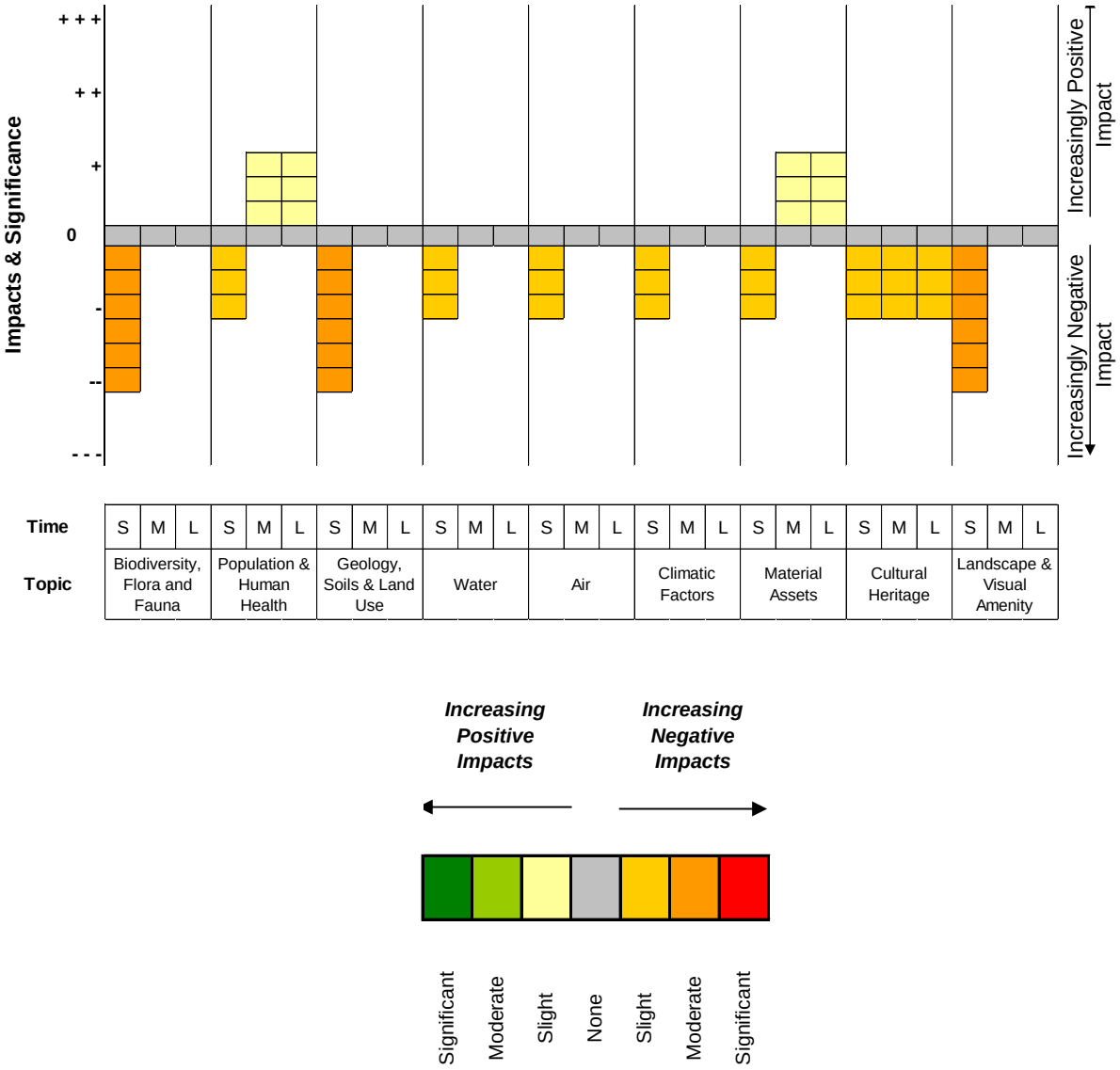


Constraints Model



Environmental Assessment			
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-1	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-1	-1	-1
Landscape & Visual Amenity (L)	-2	0	0

Summary Chart of Potential Effects



Key Conclusions:

The installation of two 275 kV cables from Ballycronan More to Ballylumford has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short-term employment opportunities from construction of the new line (+1). There is the potential for short-term, temporary, construction phase, slight to moderate impacts on Geology, Soils, and Land use due to interactions with potentially hazardous land use (-2). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the

medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, slight negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on five European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.2 Armagh and Drumnakelly Reinforcement – Project 2

Armagh and Drumnakelly Reinforcement – New Substation and Transmission Line

It is proposed to construct a new 110/33 kV substation at Armagh. This new substation would be supplied by the installation of two 110 kV circuits from Tandragee. Study areas have been determined within GIS for each proposed installation. A 1% least cost corridor has been generated for assessment of the new transmission lines, and a 50% least cost area is applicable for the new proposed substation within the study area.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – The study area intersects four ASSIs, namely Annacramph Meadows ASSI, Brackagh Bog ASSI, Drumarg ASSI and Moyrourkan Lough ASSI. The study area intersects one National Nature Reserve, namely Brackagh Bog. A total of seven SLNCIs are crossed by the study area, Annacramph, Carnganamuck Quarry, Castle Dillon Lake, Clare Glen Woodland, Drumarg, Loughgall Lake, and Marlacoo Lake. There are four Salmonoid Rivers within the study area – Callan River Lower, Cusher River Lower, Cusher River Lower Middle and Upper Bann Reach 3. The Bann Freshwater Pearl Mussel Catchment is within the study area.

Population & Human Health - There are 12 main settlements within the study area, namely Aghory, Armagh, Broomhill, Craigavon, Derryhale, Edenaveys, Hamiltonsbawn, Kilmore, Laurelvale / Mullavilly, Milltown, Richhill and Tandragee. The mean population density of this study area is 16.6 people / km^2. There are no peace lines within the study area. Within the study area there is one Neighbourhood Renewal Area in Armagh, and several areas of lower perceived health within Armagh.

Geology, Soils & Land Use – The study area covers over 162 km^2 and is composed mainly of broadleaved woodland (32%), arable land (27%), mountain, heath and bog (10%), urban land (3%) and suburban land (28%). The study area encompasses no ASSI sites of geological heritage. There are 15 unstable ground areas identified within the study area, composed of peat, mainly found along the edges of the study area's boundary. There are 128 ancient and long-established woodland areas in the study area (126 of which are located in Armagh, primarily around Armagh itself or adjacent to the main A3 road network towards Richhill, a smaller number are located near Tandragee and Hamiltonsbawn, and two are located in Craigavon); of these sites only 95 remain, with the rest classified as being lost, along with seven Forest Service sites located around Loughall. Within the study area there are 10 PPC sites and 315 historical sites that have the potential of being contaminated land, including; ceramics, cement an asphalt manufacturing works, textile

works and dye works, road vehicle fuelling, service and repair: garages and filling stations, engineering works: vehicle manufacturing works, unspecified: chemical works, engineering works, building works, factories, fuel oil suppliers, sewage works and sewage farms, waste recycling, treatment and disposal sites: hazardous waste treatment, gas works: coke works and other coal carbonisation plants, animal and animal by-products processing works and former railway land. There are three former known abandoned mines within the study area located to the east. The south of the study area includes three upland and steep slope areas.

Water – Within the study area there are 13 WFD river water bodies, all of which are of less than Good ecological status: Annagh River, Ballybay River, Ballymartrim Water, Butter Water, Callan River (Derryscollop), Cusher River (Tandragee), Killeen Water, Kilmore Tributary, Lough Neagh Peripherals, River Bann (Gilford), River Blackwater (Argory), Tall River (Derrycrew), and Tall River (Richhill). These do not extend into the Republic of Ireland. There are 316 segments of river that transect the study area; these do not have connectivity to the Republic of Ireland. There are no transitional or coastal water bodies within the study area. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including north-east and south-east of Armagh, and the Richhill, Kilmore, Hamiltonsbawn, Laurelvale, McCready's Corner, Grange Blundel and Loughgall areas. Within the study area there are no significant areas of 0.5% AEP coastal flood risk. There are numerous areas with significant 0.5% AEP pluvial flood risk widespread across the study area, including Armagh, Richill, Kilmore, Hamiltonsbawn, Laurelvale and Loughgall areas.

Air – The study area intersects one AQMA, namely the Armagh City, Banbridge and Craigavon Borough Council AQMA.

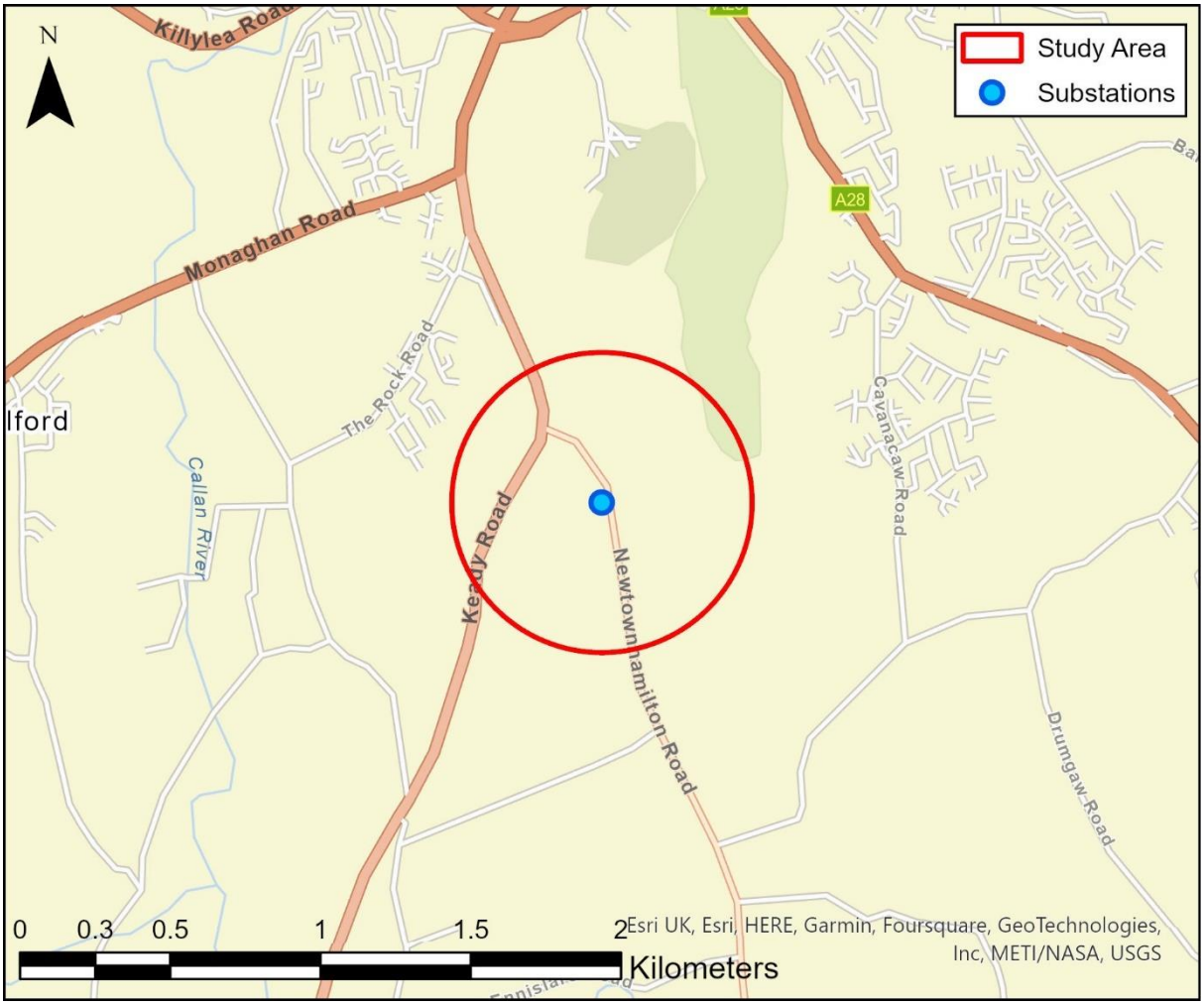
Climatic Factors – There are significant areas of 1% AEP climate change fluvial flood risk throughout the study area, including north-east and south-east of Armagh, and the Richhill, Kilmore, Hamiltonsbawn, Laurelvale, McCready's Corner, Grange Blundel and Loughgall areas. There are several areas with significant 0.5% AEP climate change pluvial flood risk widespread throughout the study area, including Armagh, Richhill, Kilmore, Hamiltonsbawn, Laurelvale and Loughgall areas.

Material Assets – Within the study area there are 47 km of A roads, 52 km of B roads, 52 km of various minor roads, 166 km of <4M tarred roads, and c. 3 km of the railway line which connects Portadown and Newry. The Gas to the West and SN spur pipelines also run through the study area, as well as six 275 kV electrical transmission lines, and thirteen 110 kV electrical transmission lines. Within the study area there is 129.45 km^2 of agricultural land; this is comprised of 10.89km^2 of non-irrigated arable land, 3.27 km^2 of complex cultivation patterns, 0.301 km^2 of land principally occupied by agriculture and 114km^2 of pastures.

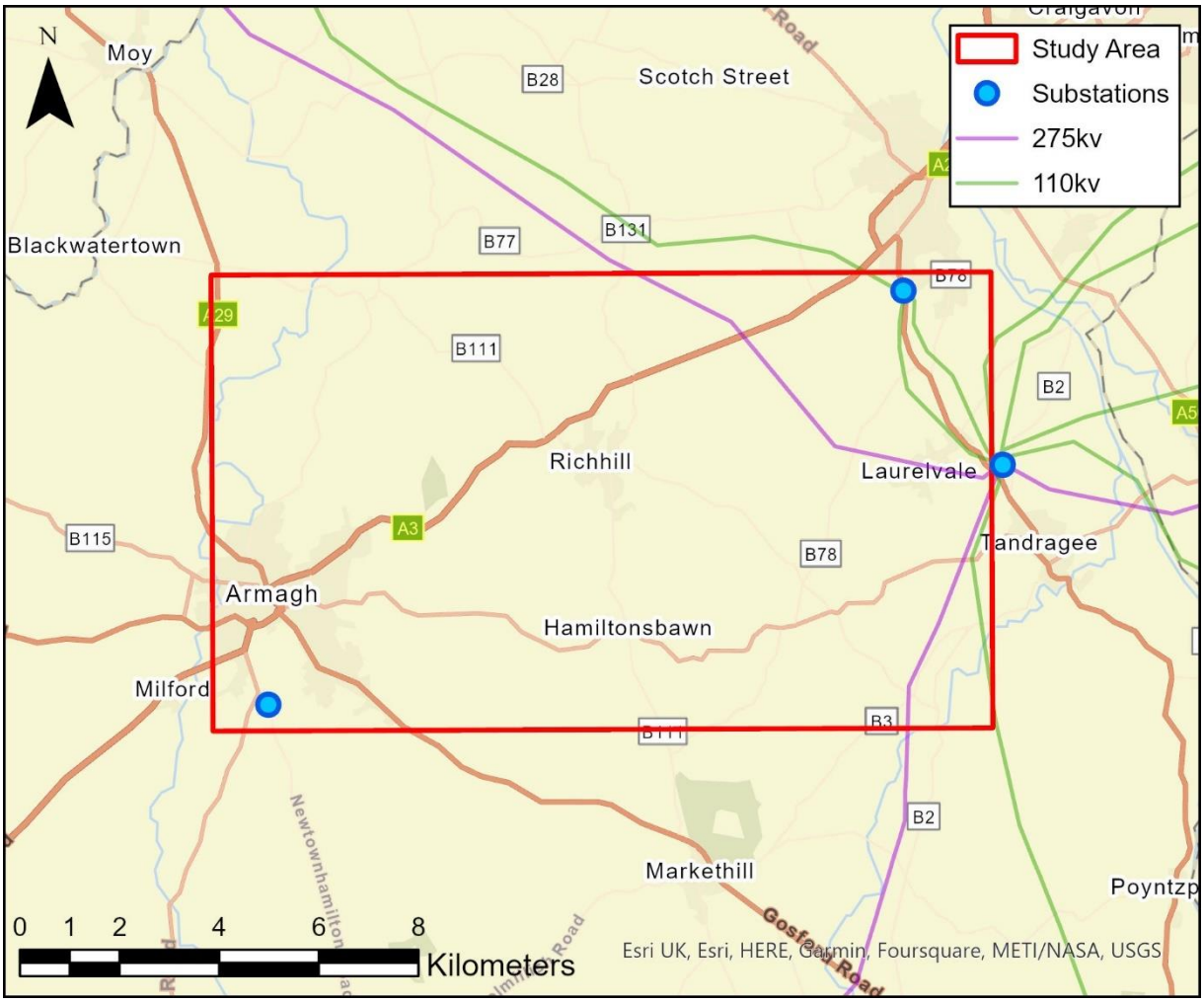
Cultural, Architectural & Archaeological Heritage – Within the study area there are 192 SMR sites and 17 Scheduled Zones, including crannogs, medieval features and several raths. There are 346 Listed Buildings within the study area, along with 325 Industrial Heritage sites, and seven Defence Heritage sites including St Luke's Hospital, Armagh ROC post and Tandragee Castle. There are nine listed parks and gardens within the study area of Castle Dillion, Deans Hill, Hockley Lodge, Loughgall Manor House, Tandragee Castle, The Mall (Armagh), The Observatory (Armagh), The Palace (Armagh) and Umgola.

Landscape & Visual Amenity – The study area crosses six Landscape Character Areas (LCAs), of which one is of High sensitivity (Upper Bann Floodplain LCA), three are of Medium / High sensitivity (Armagh Drumlins LCA, Loughgall Orchard Belt LCA and Craigavon Plateau LCA), and two are of Low / Medium sensitivity (Armagh / Banbridge Hills LCA, Carrigatuke Hills) to development.

Study Area

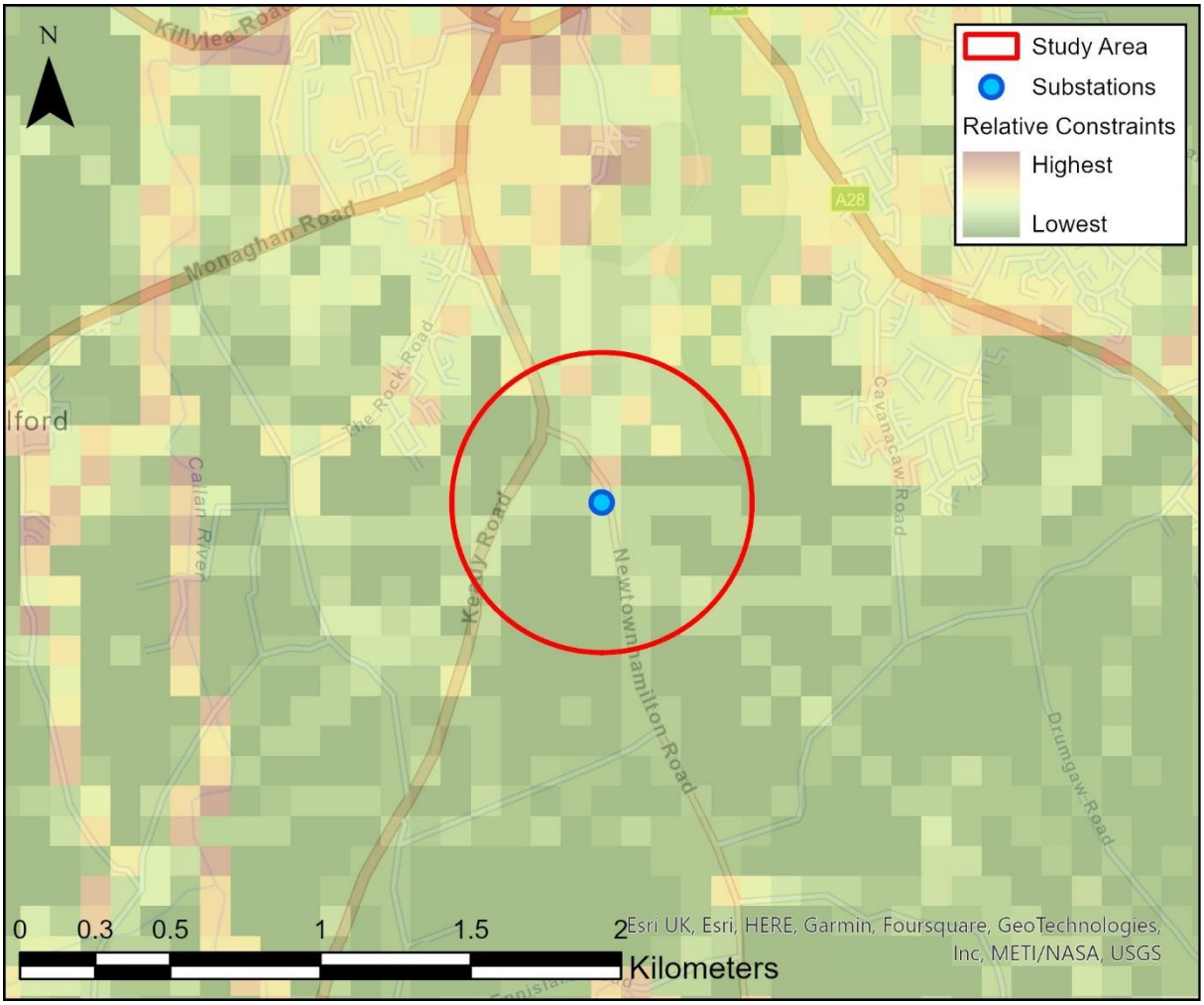


Armagh Substation Study Area

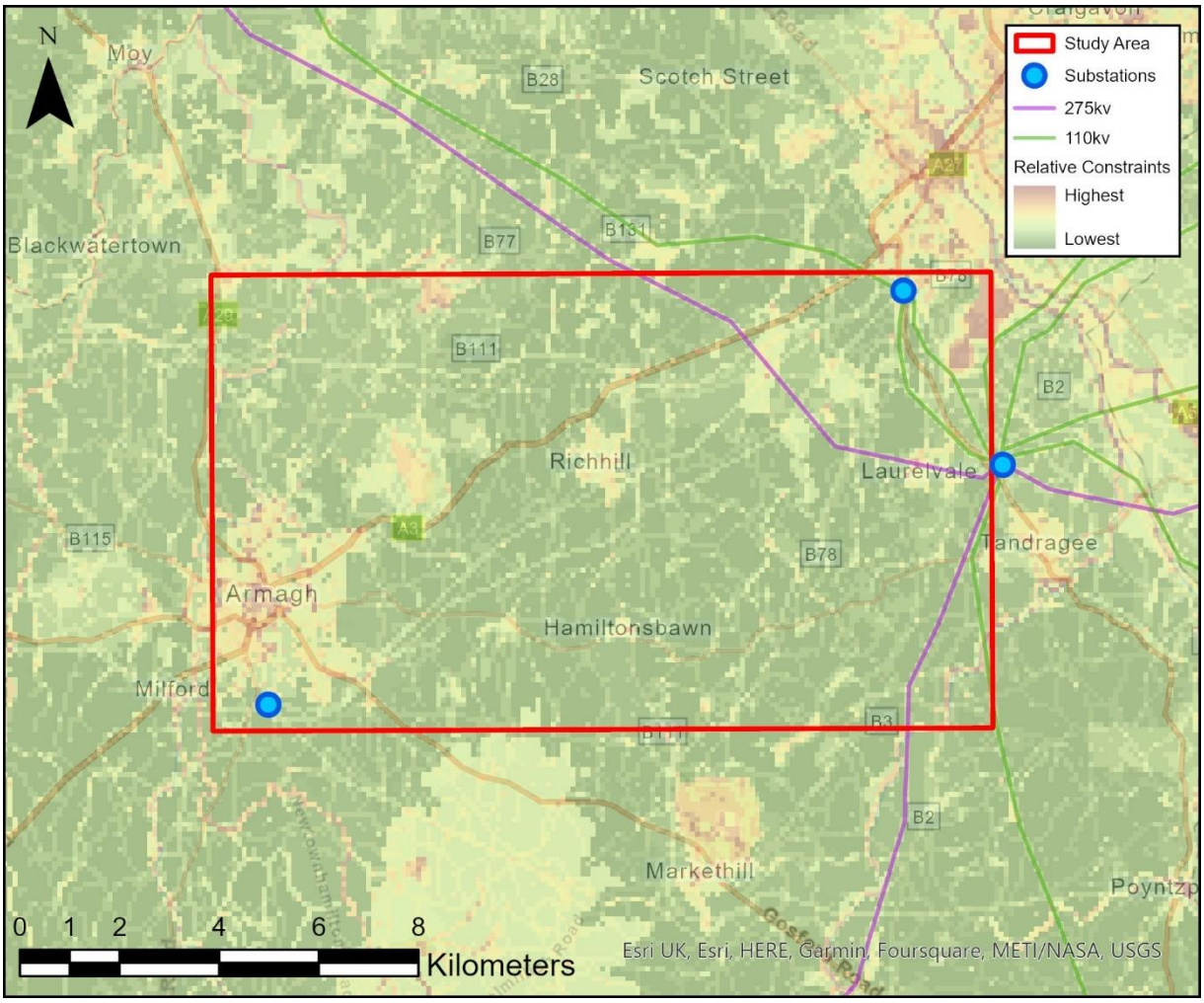


New Transmission Line Study Area

Constraints Model



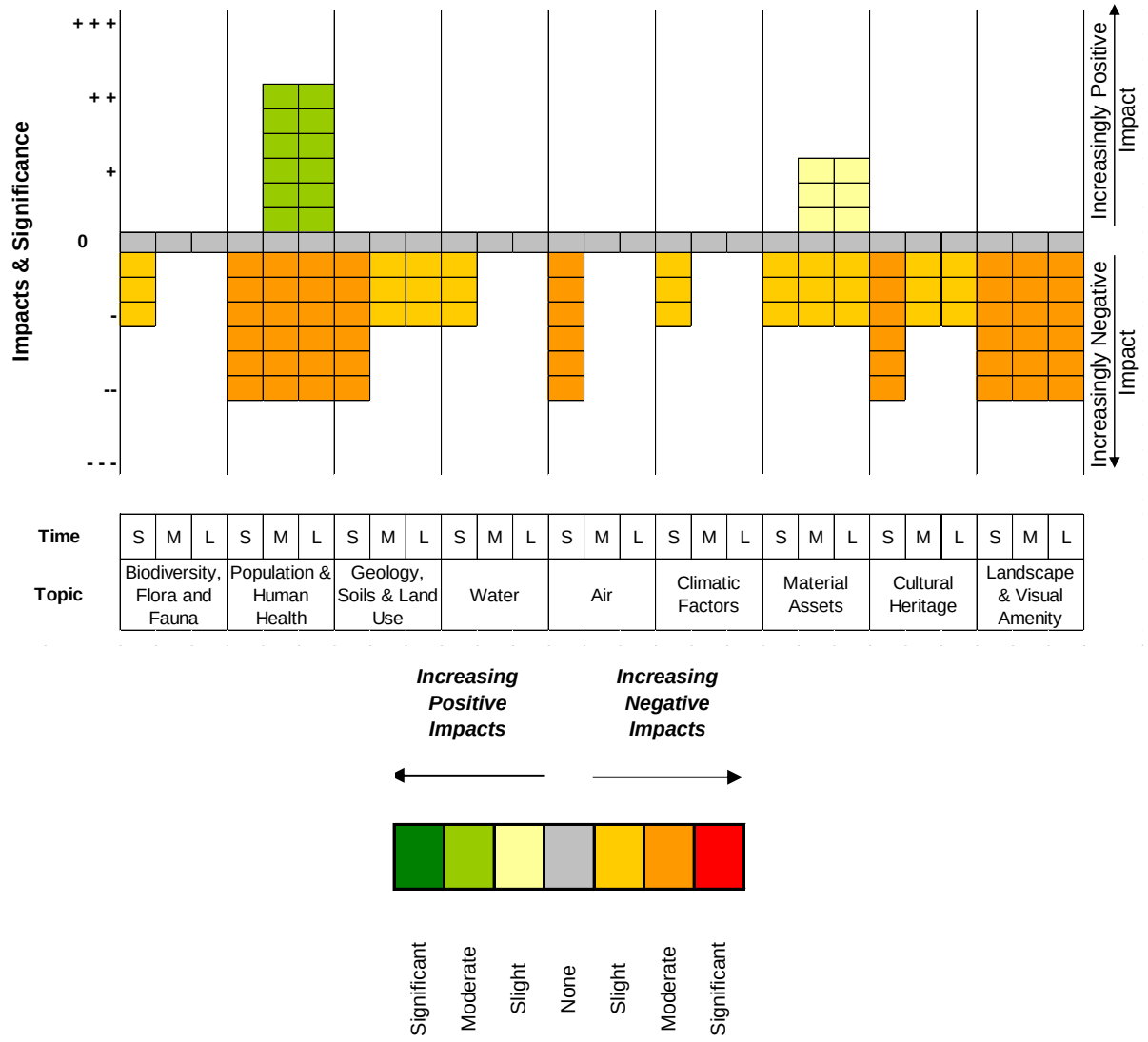
Armagh Substation Study Area Constraints



New Transmission Line Study Area Constraints

Environmental Assessment			
Environmental Topic	**Short-Term Effects**	**Medium-Term Effects**	**Long-Term Effects**
Biodiversity, Flora & Fauna (BFF)	-1	0	0
Population & Human Health (PHH)	-2	-2 / +2	-2 / +2
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-2	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	-2	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of a new substation at Armagh, and new transmission lines connecting to Tandragee has the potential for short-term, temporary, construction phase, slight negative impacts on protected species due to potential hydrological connectivity (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to slight to moderate improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new line (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation and OHL structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts

on Air during the construction phase, including in a sensitive area (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight potential for medium- or long-term impacts on these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.3 East Tyrone Reinforcement – Project 3

East Tyrone Reinforcement – Substation Exension

It is proposed to extend Dungannon main substation and to install two new 110/33 kV transformers. The substation itself will be expanded onto adjacent land. A 50% least cost area has been used for assessment purposes for the proposed substation.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There are no habitat or biodiversity designations within the study area.

Population & Human Health - There are no main settlements within the study area. The mean population density within the study area is 1.06 people / km^2. There are no peace lines, Neighbourhood Renewal Areas or areas of lower perceived health within the study area.

Geology, Soils & Land Use – The study area covers 0.08 km^2 and is composed mainly of broadleaf woodland (3%), improved grassland (57%), semi-natural grassland (22%), arable land (2%), and mountain, heath and bog (14%). The study area does not intersect any ASSI sites of geological heritage. There are no ancient and long-established woodland areas, or Forest Service sites within the study area. Within the study area there is one abandoned mine, situated to the west of the existing substation. There are no PPC sites or historical sites that have the potential of being contaminated land, and no quarries. There are no areas of unstable ground identified, and no areas of upland steep slope.

Water – There are two WFD river water bodies within the study area; these are the Tamnamore Stream (of Moderate WFD status) and the Torrent River (of Moderate Ecological Potential status). There are no lake water bodies, river segments, bathing waters, transitional / coastal waters, drinking water bodies or shellfish waters within the study area. There are several areas with significant 0.5% AEP pluvial flood risk within the study area, with two located in the north-east and two located in the south.

Air – There are no AQMAs or other known significant air quality issues within the study area.

Climatic Factors – There are six areas with significant 0.5% climate change pluvial flood risk within the study area; five are located in the south and one is located in the north, intersected by the study area.

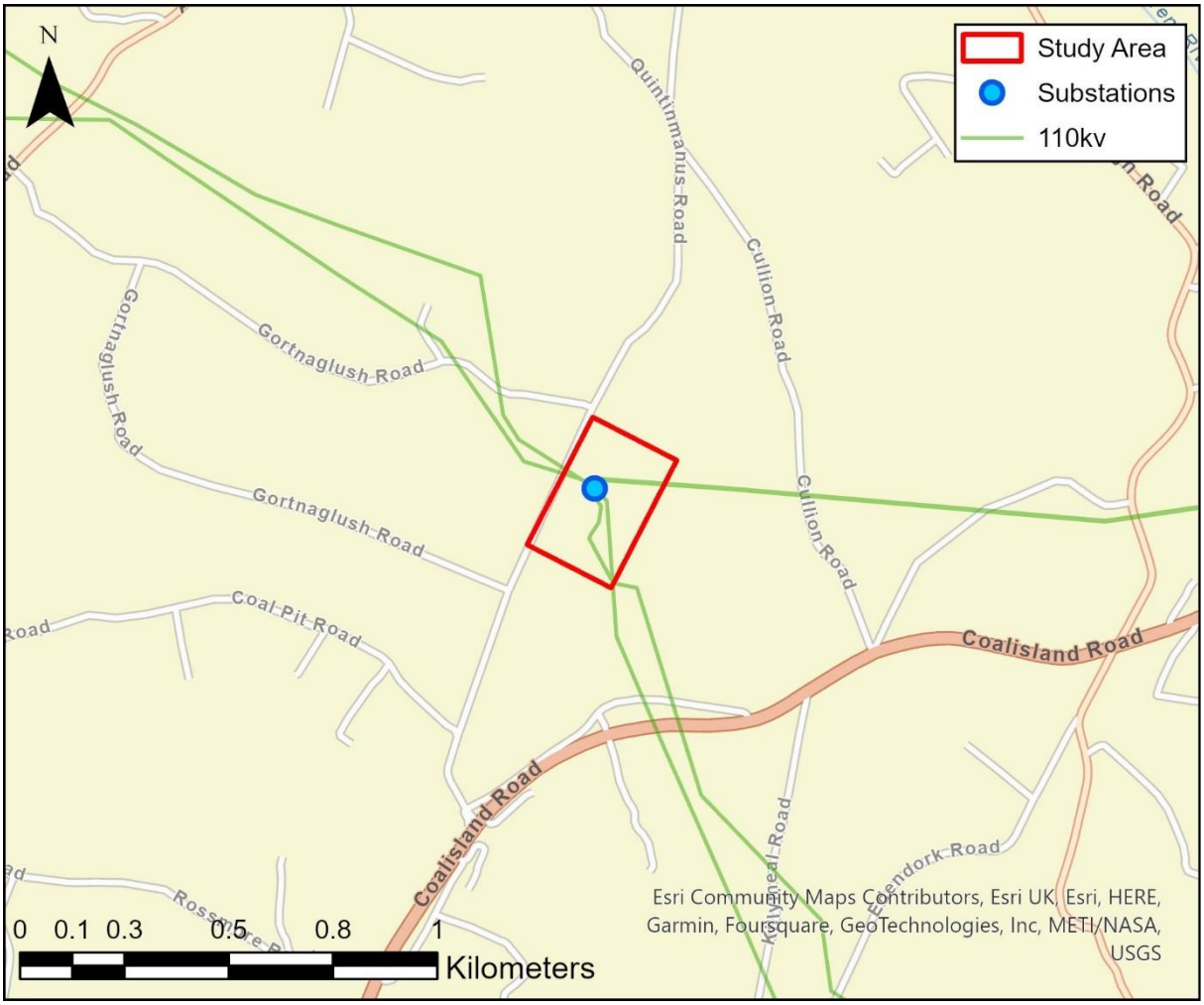
Material Assets – There is 347 m of minor road which runs adjacent to the western boundary of the study area, with 117 m of this road located within the boundary. There are nine existing 110 kV electricity

transmission lines within the study area. Within the study area there is 0.08 km^2 of agricultural land which is entirely comprised of pastures.

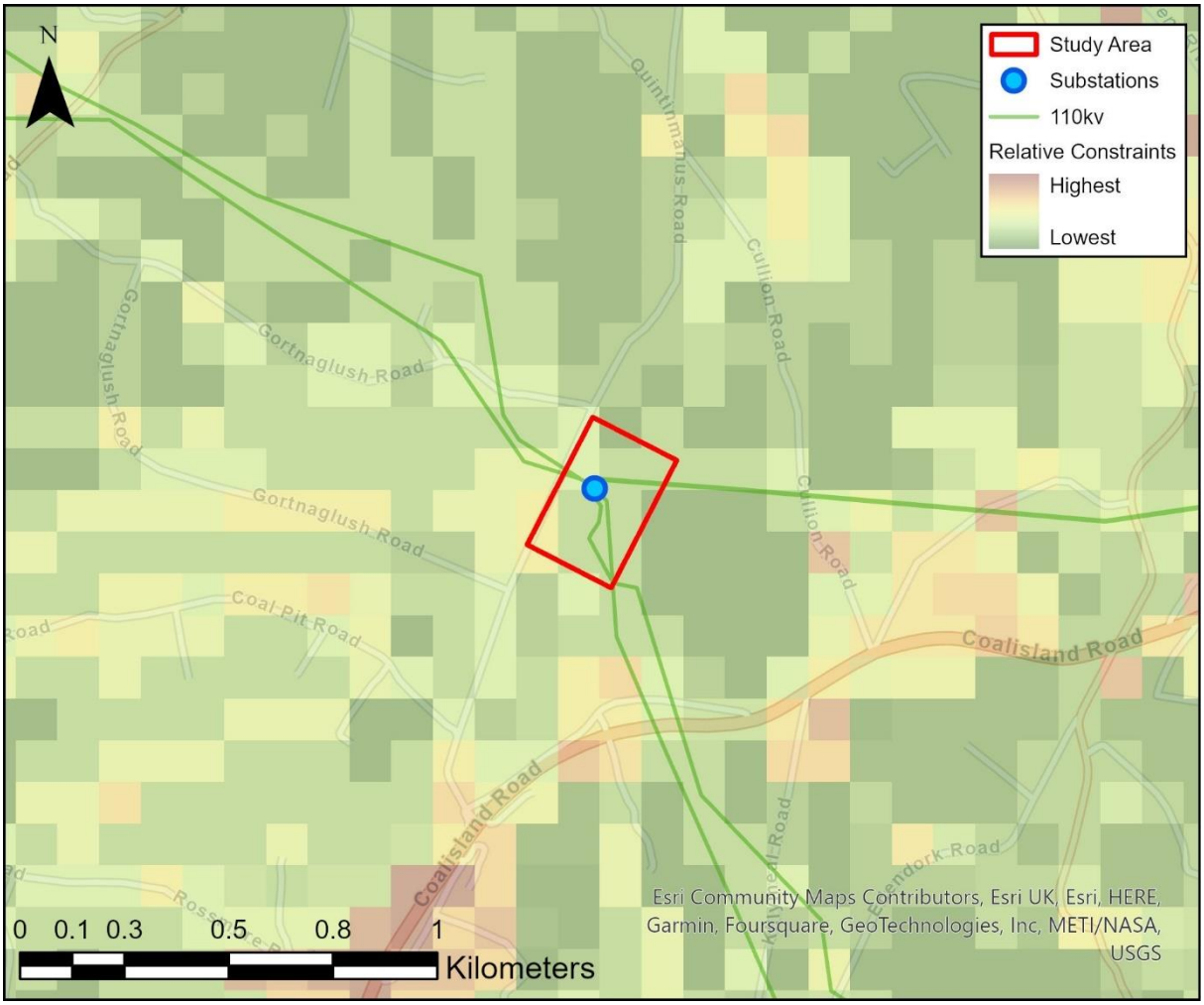
Cultural, Architectural & Archaeological Heritage – There are no sites of cultural, architectural, or archaeological importance within the study area.

Landscape & Visual Amenity – The study area encompasses one Landscape Character Area, namely the Dungannon and Drumlin Hills LCA, which is deemed as having a Medium / High sensitivity to development.

Study Area



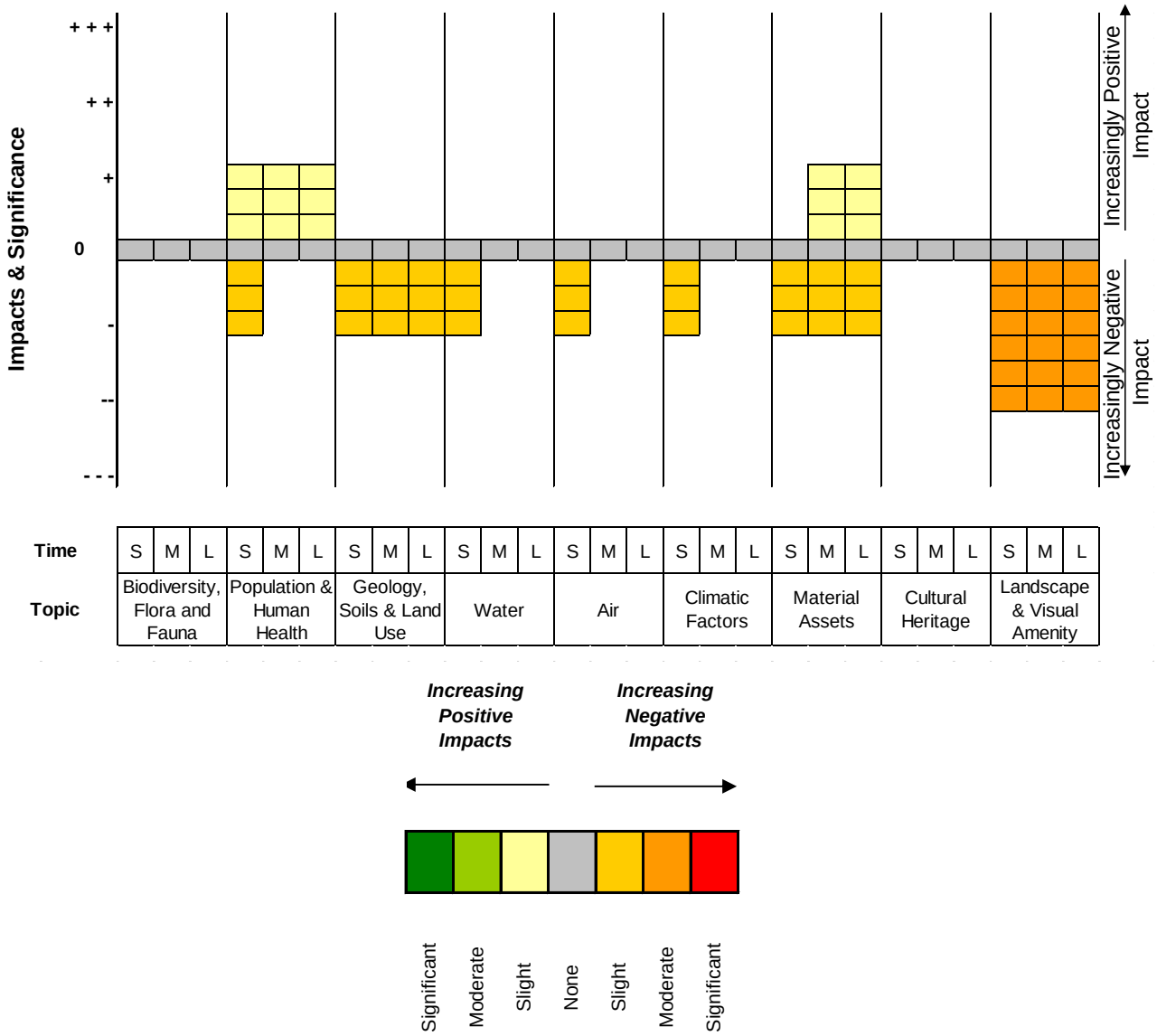
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	0	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-1	-1	-1
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	0	0	0
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Dungannon substation extension has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation extension (+1). There is the potential for short-, medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and

interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts on Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.2.4 Newry Reinforcement – Project 4

Newry Reinforcement – New Substation and New / Uprate Transmission Line

There is a need to increase capacity at Newry Main substation. This project is at an early stage and options are still to be fully developed. Likely alternatives include construction of a 2nd substation adjacent to Newry Main and uprating of the overhead lines to Tandragee; a new substation near Newtownhamilton connecting to the Louth - Tandragee 275 kV overhead double circuit; or new 33 kV (distribution) circuits transferring load from Newry to Armagh.

For assessment purposes, three options have been considered, as follows:

Option A

Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee. A 50% least cost area has been generated for the new Newry substation. For assessment purposes, the initial study area for the restring corridor of the 110 kV Newry to Tandragee OHL has been set as 500 m either side of the existing line.

Option B

Construction of a new substation near Newtownhamilton. A 50% least cost area has been generated for the new substation within this area.

Option C

Construction of a new 33 kV distribution circuit from Newry to Armagh. A 1% least cost corridor has been generated, which extends from Newry to Armagh.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There is one SAC within the study area, namely the Derryleckagh SAC. The study area crosses seven ASSIs, namely Aughnagon Quarry, Brackagh Bog ASSI, Cam Lough ASSI, Castle Enigan ASSI, Derryleckagh ASSI, Goraghwood Quarry ASSI and Moyrourkan Lough ASSI. In total, there are nine SLNCIs crossed by the study area (Castle Dillon Lake, Clare Glen Woodland, Drummilt Railway-Lough Gilly and Danes Lough, Gosford Forest Park, Knocknagore Fen, Lough Shark, Loughall Lake, Marlacoo Lake and Outlack Bog), as well as one National Nature Reserve – Brackagh Bog NNR. Within the study area there are 24 Salmonid Rivers / tributaries and one Salmonoid lLake (Cam Lough). The Bann Freshwater Pearl Mussel Catchment is intersected by the study area.

Population & Human Health - There are 37 main settlements within the study area. This study area has a mean population density of 18.6 people / km^2. The study area encompasses one Neighbourhood Renewal Area of Newry, and there are areas of lower perceived health within Armagh, Newry, Banbridge and Loughbrickland. There are no peace lines within the study area.

Geology, Soils & Land Use – The study area covers 742 km^2 and is composed of coniferous woodland (2%), improved grassland, (57%), mountain heath and bog (7%), semi-natural grassland (1%), arable land (5%) and suburban land (4%). There are 276 ancient woodland areas scattered throughout the study area, predominantly around Armagh and Banbridge (80 of these areas are now listed as lost), as well as 64 Forest Service sites (part of Ballymoyer, Camlough, Cold Brae, Drumsbangher, Gosford, Loughgall, Seagahan and The Fews). There are 48 areas of unstable ground that are comprised of peat scattered throughout the study area. Within the study area there are 31 PPC sites and 910 historical sites that have the potential of being contaminated land. There are 13 abandoned mines located within the study area. The study area contains four quarries, with one located to the west of Scarvagh off the Auglish Road, one south-west of Clady Milltown off the Black Quarter Road and two west of Lurganare off the Glen Road. There are 26 upland areas located to the south-west of the study area.

Water – Within the study area there are 35 WFD rivers; of these, only one has Good ecological status (Forkhill River), while the remaining 34 have less than Good ecological status, with the majority being considered as Moderate ecological status. There are three river water bodies that extent into the Republic of Ireland (Butter Water, Callan River and Clay River), with 162 cross-border river segments. There are 1159 river segments contained within the study area. Within the study area there is one WFD Lake (Cam Lough) and one WFD Transitional water body (Newry Canal), which have Poor ecological potential and Moderate ecological potential, respectively. The study area contains one drinking water river (Butter Water) and one drinking water lake (Cam Lough). There are numerous regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Newry, Richill, Tandragee, Gilford, Laurelvale, Scarva, Pontyz Pass, Newtownhamilton, Hamiltonsbawn, Markethill and Mountnorris areas. There are areas of 0.5% AEP pluvial flood risk widespread across the study area, with significant regions located in the Newry, Mountnorris, Hamiltonsbawn, Pontyz Pass and Richill areas.

Air – Within the study area there are three AQMAs, being in Armagh City, Banbridge and Craigavon Borough Council, Newry (Canal Street) and Newry (Urban Centre). There are no other known air quality issues within the study area.

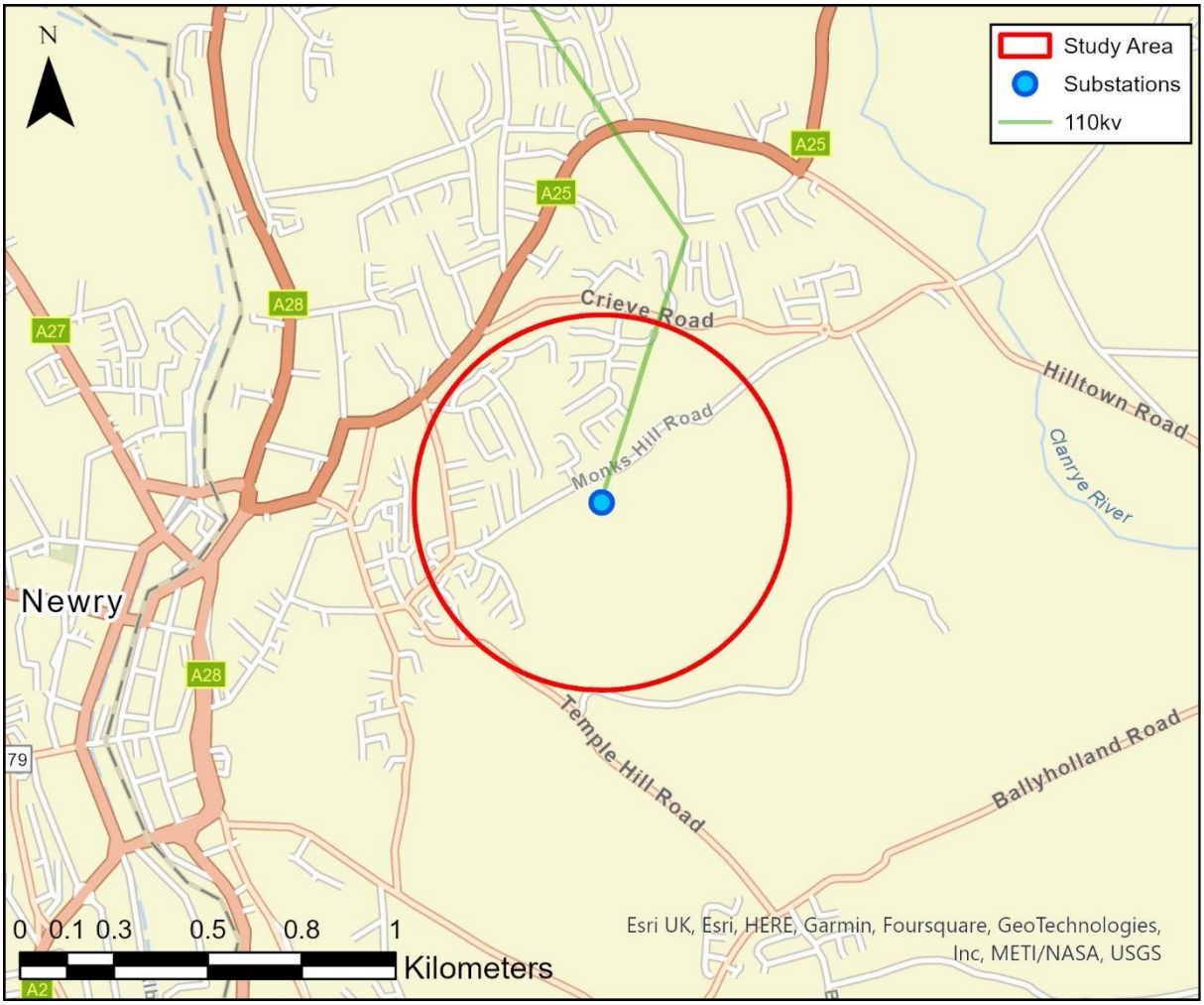
Climatic Factors – There are numerous regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Newry, Richill, Tandragee, Gilford, Laurelvale, Scarva, Pontyz Pass, Newtownhamilton, Hamiltonsbawn, Markethill and Mountnorris areas. There are areas of 0.5% AEP climate change pluvial flood risk widespread across the study area, with significant regions located in the Newry, Mountnorris, Hamiltonsbawn, Pontyz Pass and Richill areas.

Material Assets – Within the study area there are 15 km of dual carriageway, 159 km of A roads, 168 km of B roads, 401 km of minor roads, and 686 km of <4M tarred roads. There is c. 47 km of railway line within the study area. Within the study area there are three gas transmission links of Gas to the West, SN Spur and S-N pipeline, and 20 electrical transmission lines, six of which are 275 kV OHLs and 14 of which are 110 kV OHLs. Within the study area there is 575 km^2 of agricultural land, this is comprised of 47.4 km^2 of non-irrigated arable land, 10.77 km^2 of complex cultivation patterns, 1.7 km^2 of land principally occupied by agriculture, and 515 km^2 of pastures.

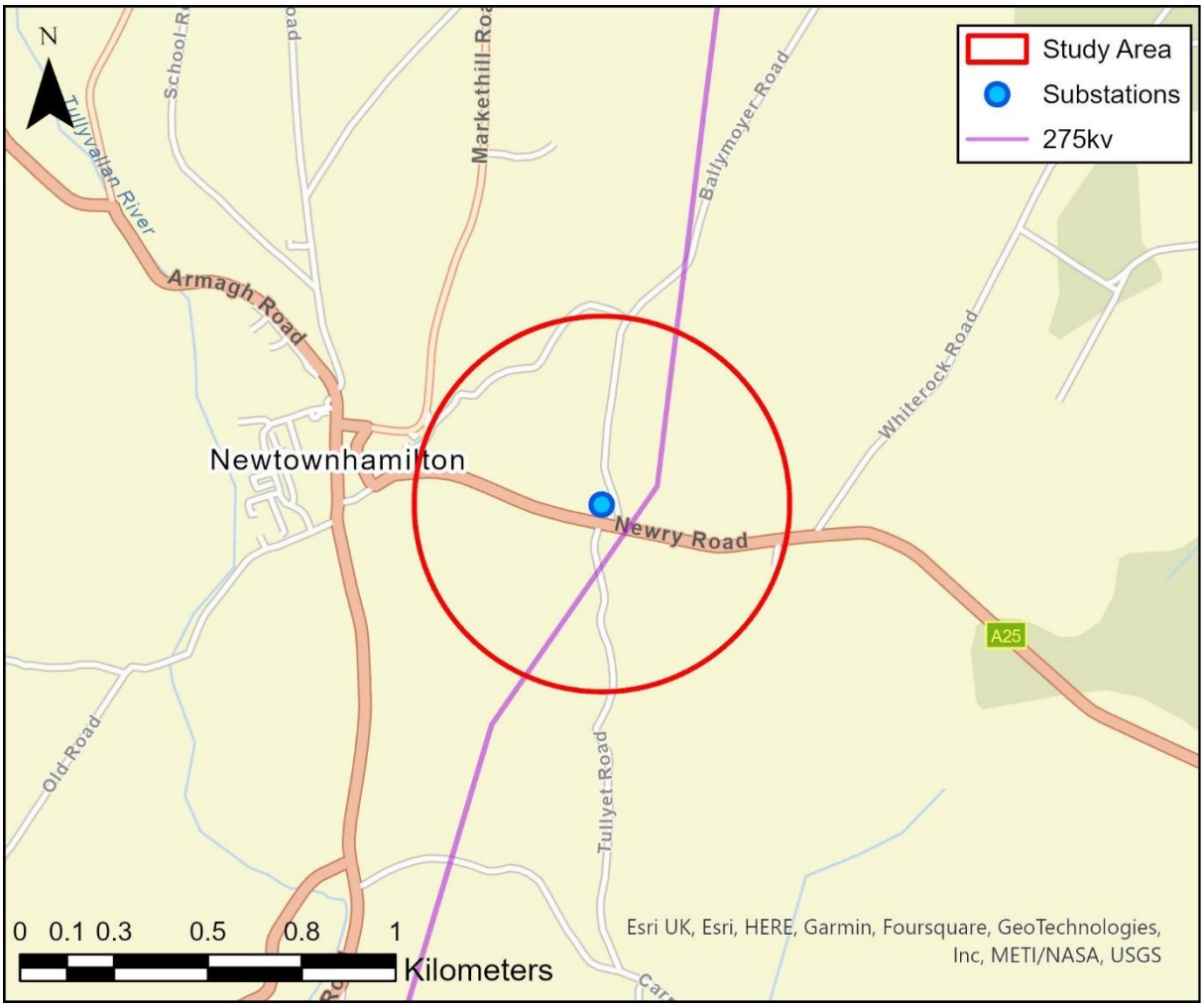
Cultural, Architectural & Archaeological Heritage – Within the study area there are 860 SMR sites and 121 Scheduled Zones. The study area contains 1243 Listed Buildings, 1182 Industrial Heritage areas, 82 Defence Heritage areas, and 12 Areas of Archaeological Potential. There are 17 listed Parks and Gardens that are contained within, or intersected by, the study area.

Landscape & Visual Amenity – There are 12 Landscape Character Areas within the study area, of which three are of High sensitivity (Upper Bann Floodplain LCA, Slieve Roosley LCA and Ring of Gullion LCA), five are of High / Medium sensitivity (Armagh Drumlins LCA, Crossmaglen Drumlins and Loughs LCA, Loughgall Orchard Belt LCA, Newry Basin LCA and Craigavon Plateau LCA), and four are of Low / Medium sensitivity (Armagh / Banbridge Hills LCA, Carrigatuke Hills LCA, Iveagh Slopes LCA and North Banbridge Hills LCA) to development. Two National Trust Lands are contained within the study area, namely Ballymoyer and Derrymore. The Ring of Gullion AONB is the only AONB that is intersected by the study area.

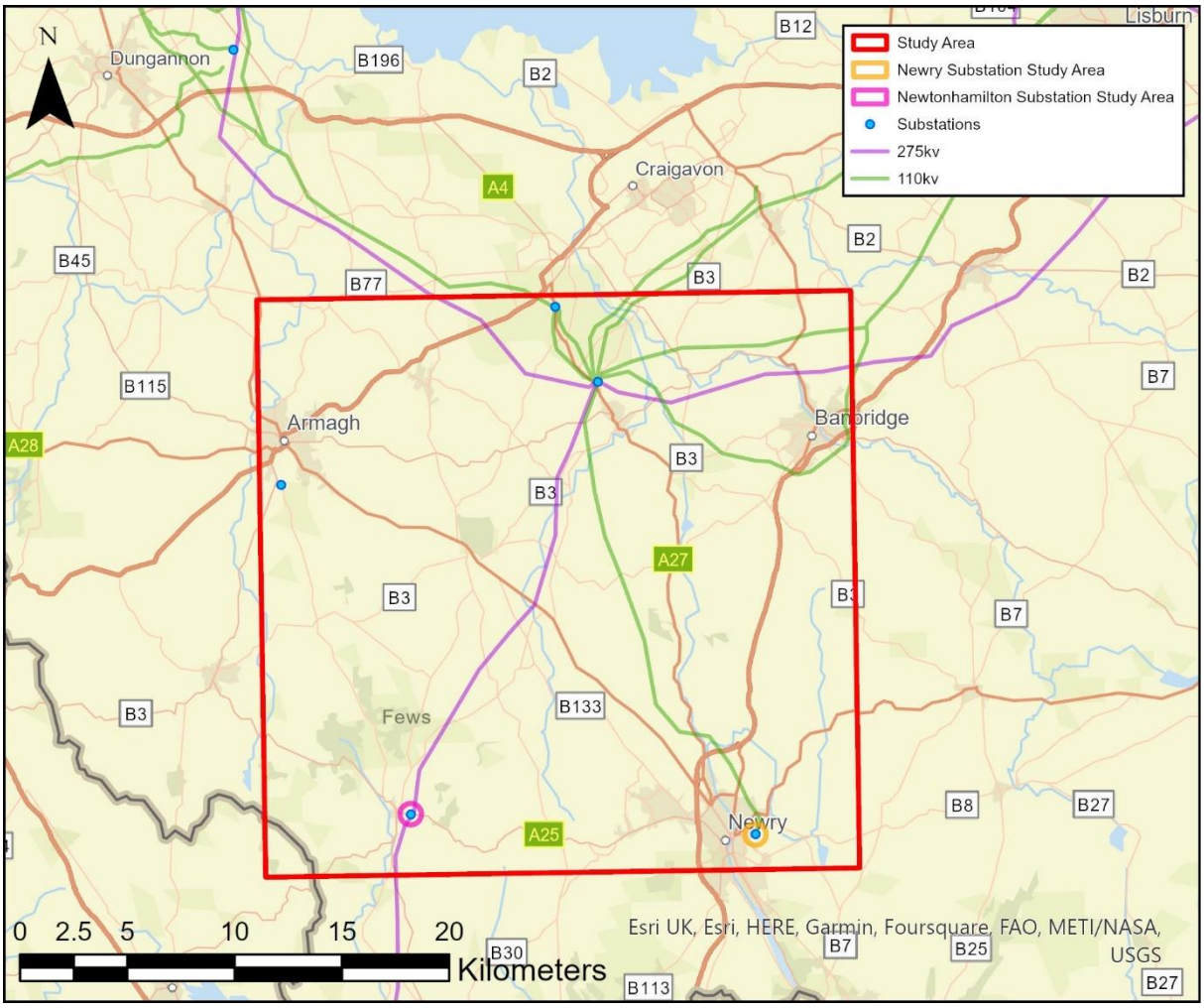
Study Area



Newry Substation Study Area

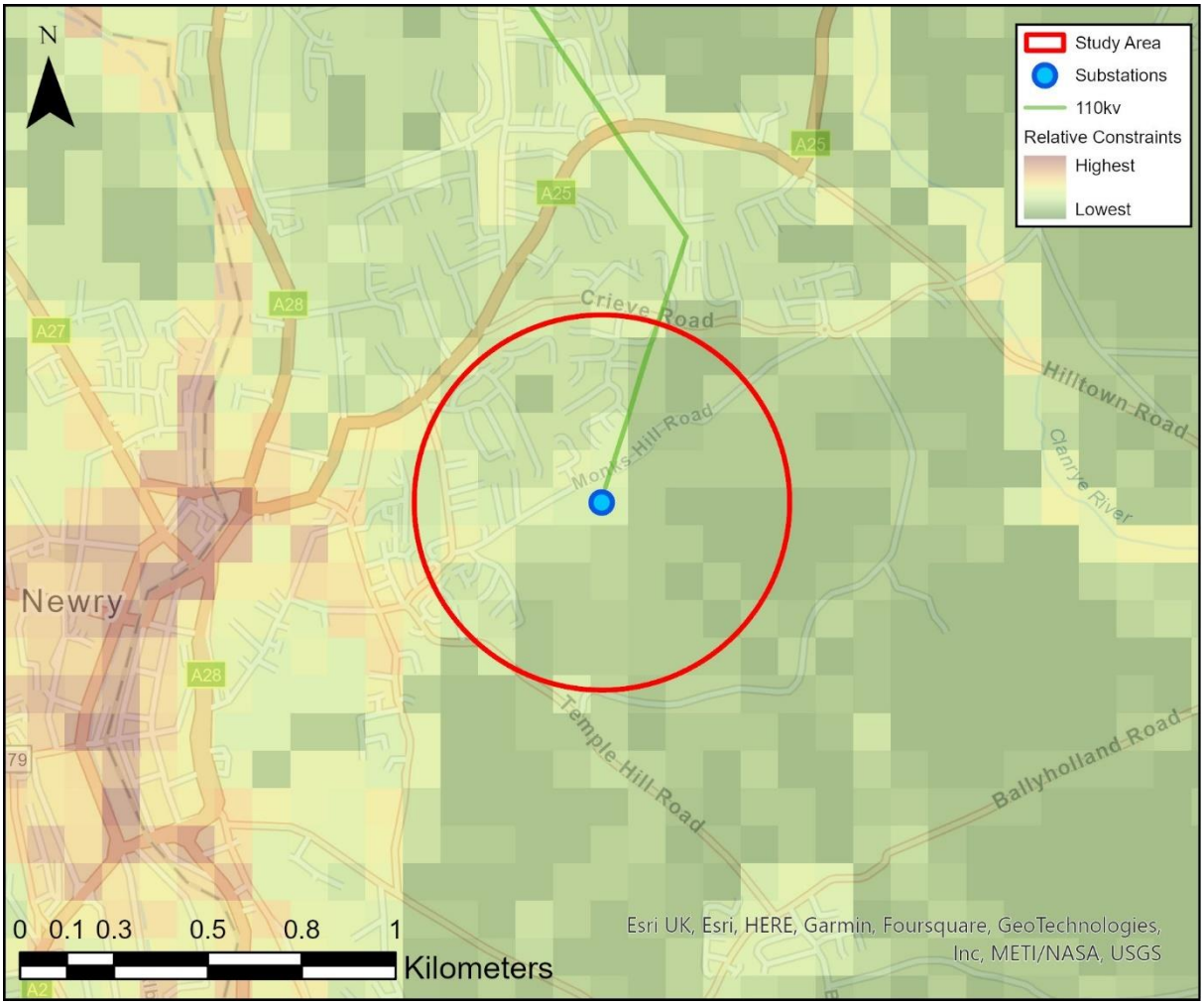


Newtownhamilton Substation Study Area

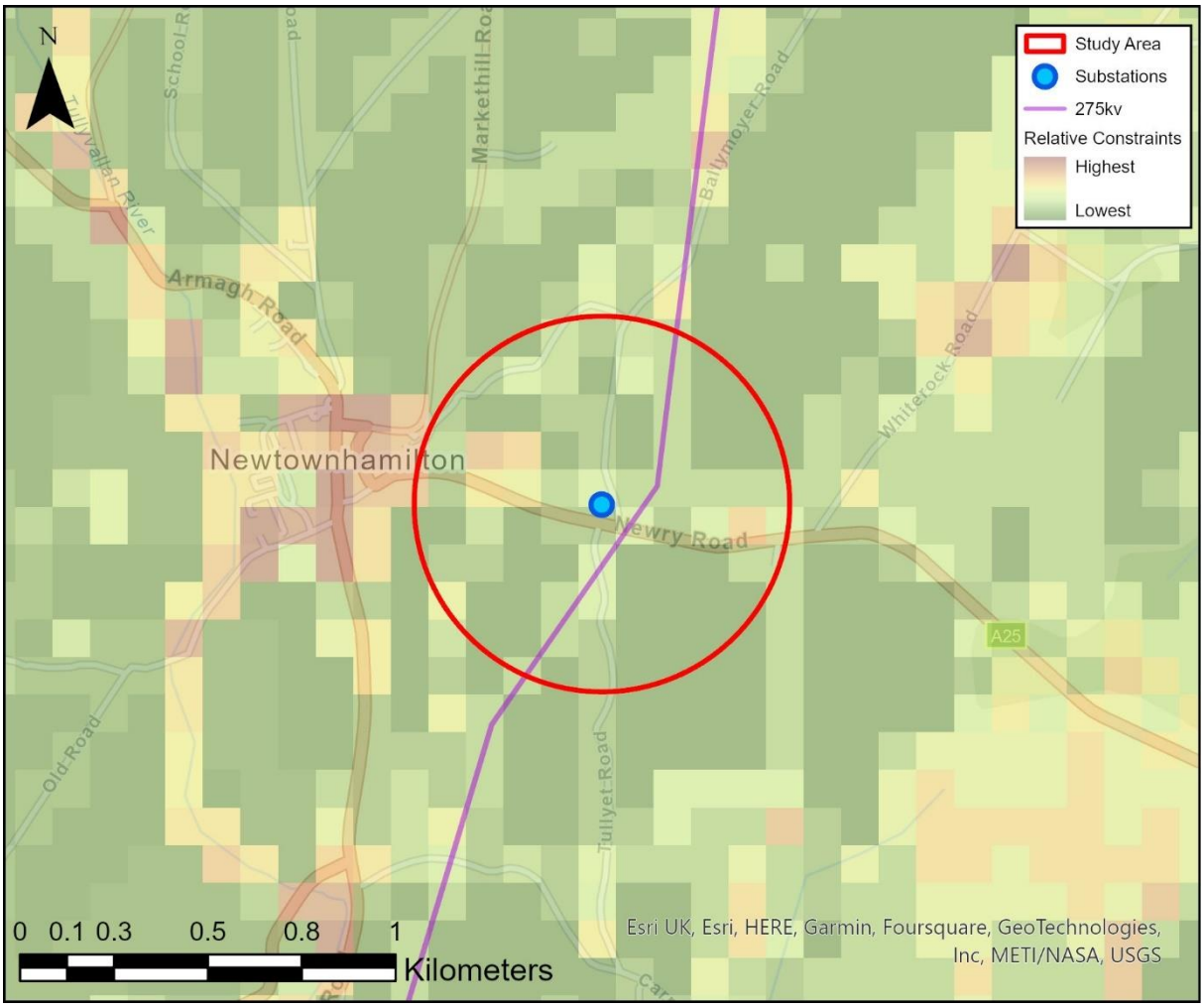


Newry Reinforcement Study Area

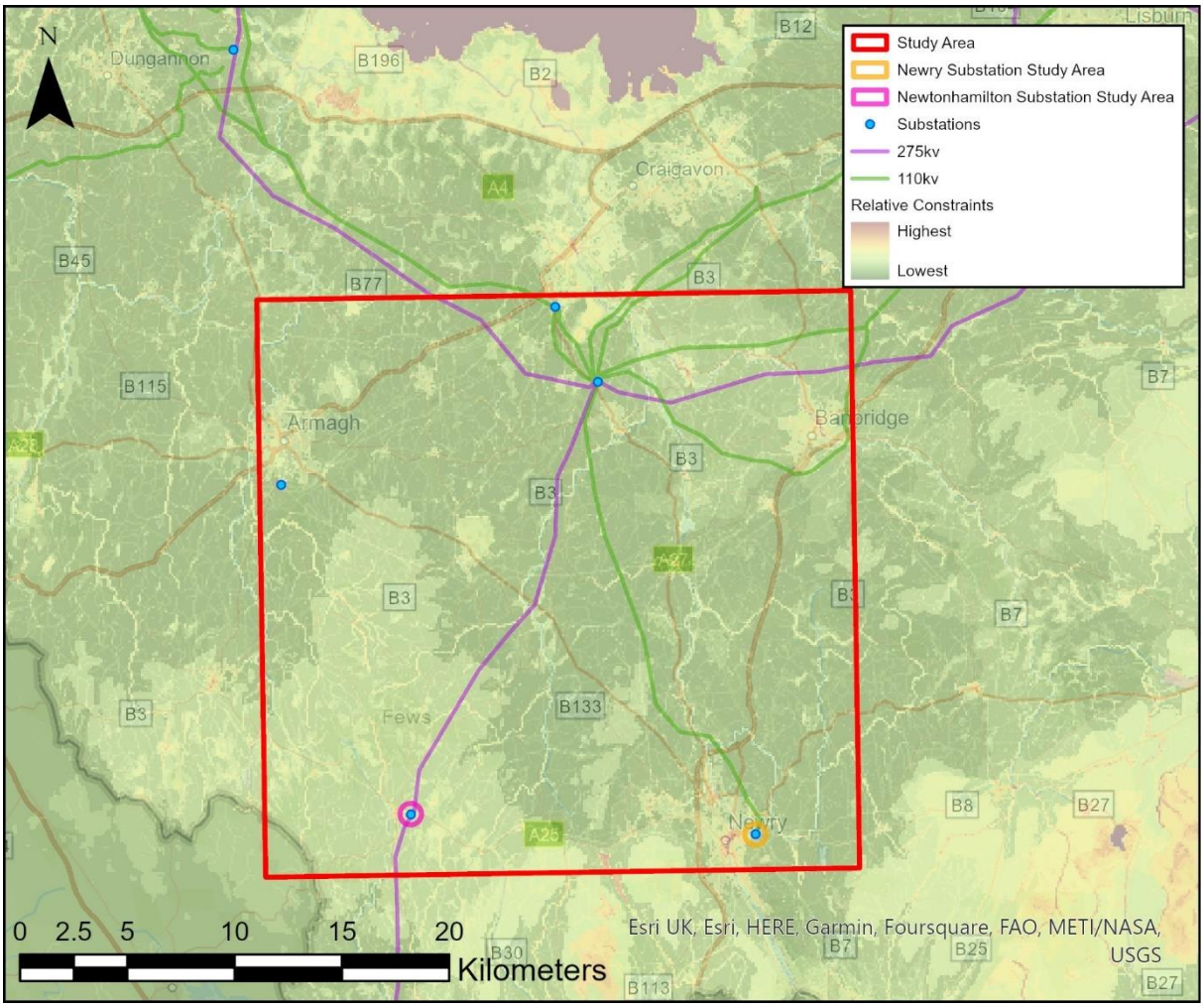
Constraints Model



Newry Substation Study Area Constraints



Newtownhamilton Substation Study Area Constraints

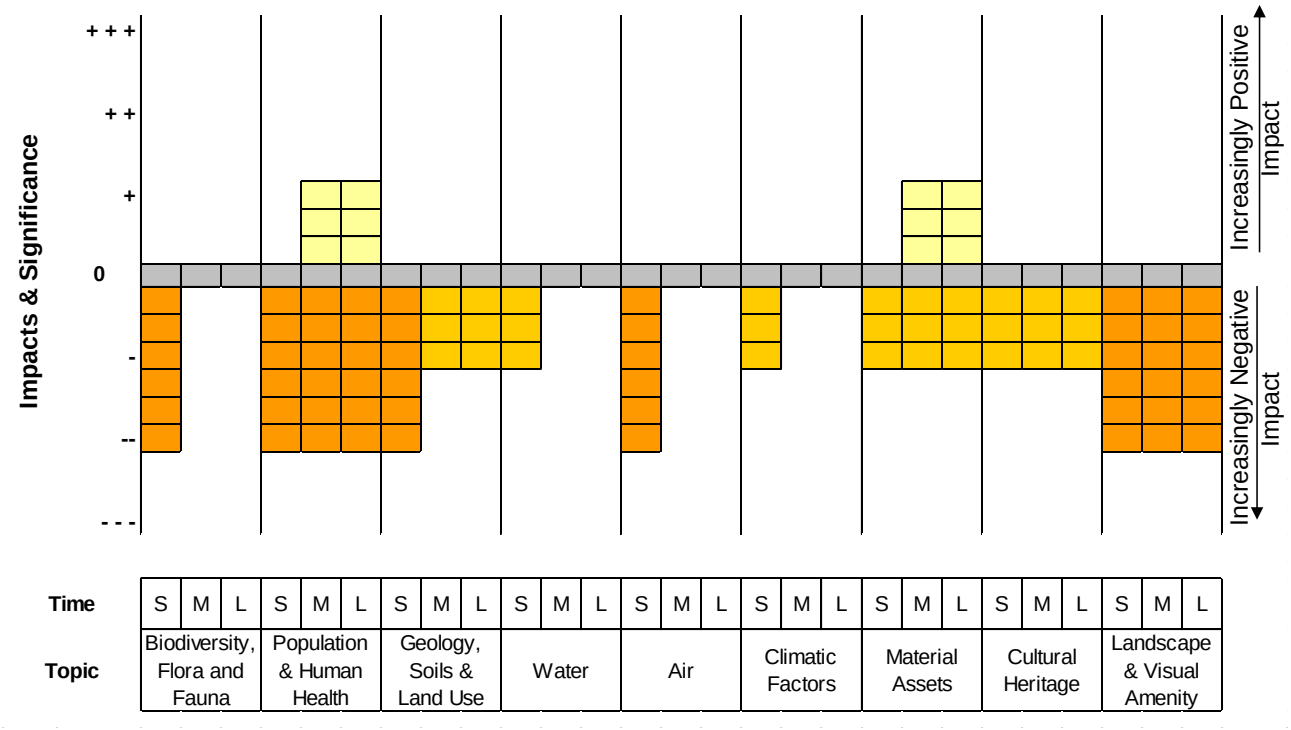


Newry Reinforcement Study Area Constraints

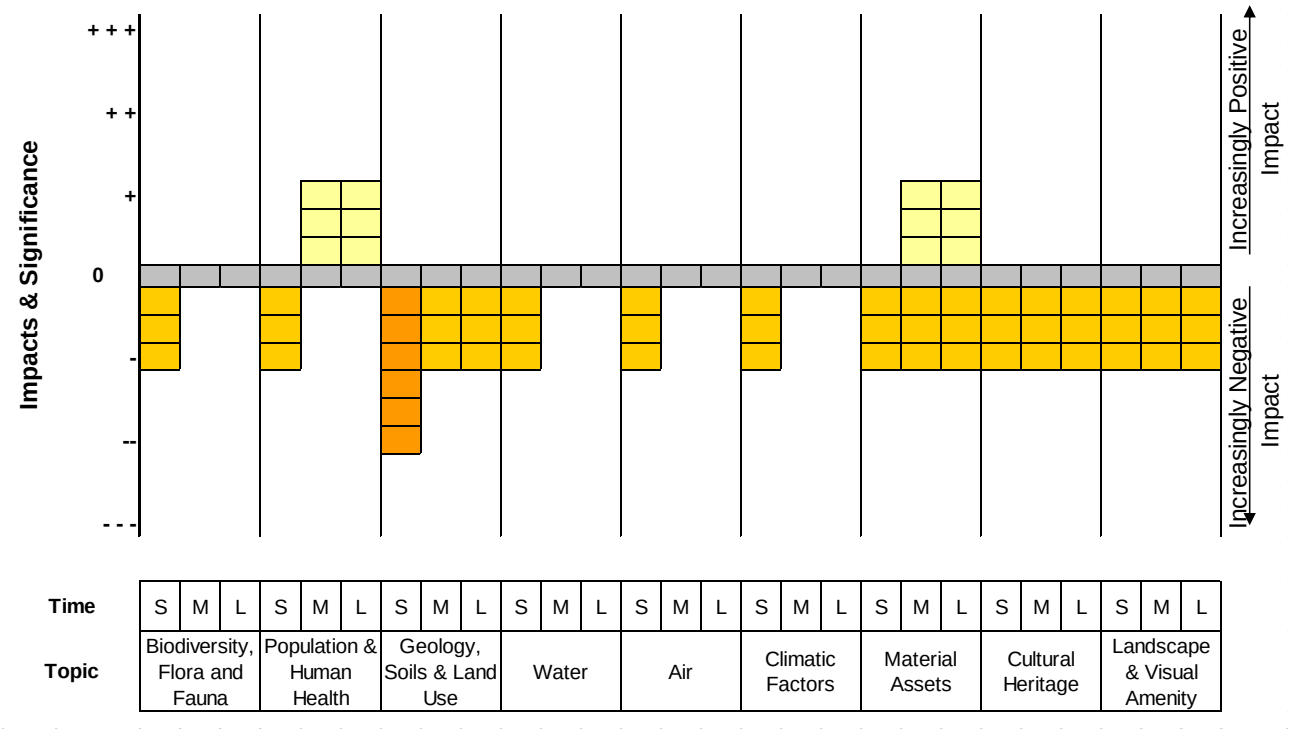
Environmental Assessment			
Environmental Topic	**Short-Term Effects**	**Medium-Term Effects**	**Long-Term Effects**
Option A			
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-2	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-2	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	-1	-1	-1

Landscape & Visual Amenity (L)	-2	-2	-2
Option B			
Biodiversity, Flora & Fauna (BFF)	-1	0	0
Population & Human Health (PHH)	-1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	-1	-1	-1
Landscape & Visual Amenity (L)	-1	-1	-1
Option C			
Biodiversity, Flora & Fauna (BFF)	-1	0	0
Population & Human Health (PHH)	-2	-2 / +2	-2 / +2
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-2	0	0
Air (A)	-2	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-2	+2	+2
Cultural, Architectural & Archaeological Heritage (CH)	-2	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Option A



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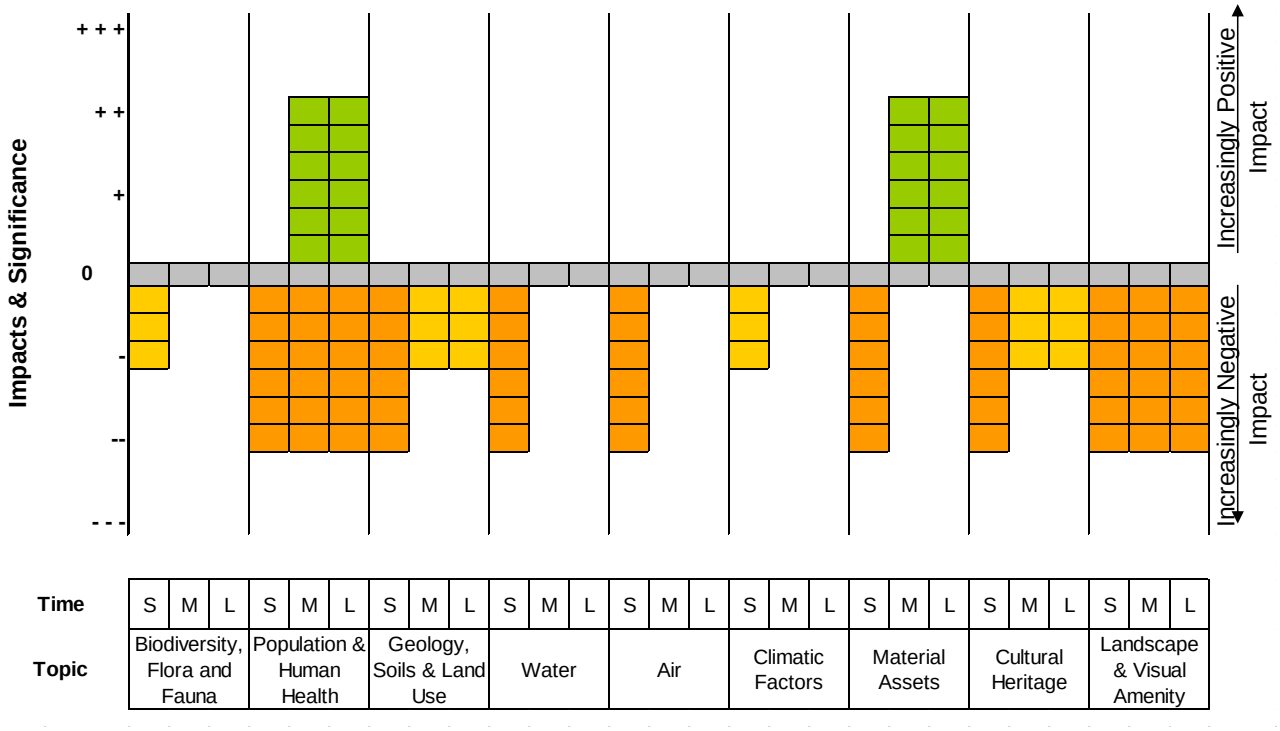
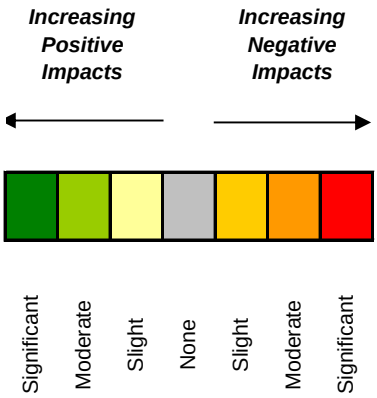


Option C



Key Conclusions:

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

Development of the Newry substation and uprating of the OHL to Tandragee has the potential for short-term construction phase, slight to moderate, indirect negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national, and local designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, including in socially sensitive areas (-2), and medium- to long-term negative effects from the presence of new infrastructure in these high population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils

and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including in sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

Option B: Construction of a new substation near Newtownhamilton.

Development of the new substation at Newtownhamilton has the potential for short-term, temporary, construction phase, slight negative impacts on Biodiversity Flora and Fauna, including to one Salmonid River (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, slight negative impacts on Landscape and Visual Amenity, including within a non-sensitive LCA (-1).

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

Development of the new distribution OHL has the potential for short-term, temporary, construction phase, slight negative impacts on Biodiversity Flora and Fauna, including to Salmonid Rivers (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the

presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to slight to moderate improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new line (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the OHL structures (-1).There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase, on water quality (-1), and associated with flood risk areas (-2); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including in sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, slight to moderate negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-2); in the medium- and long-term there is potential for slight to moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for slight, medium- or long-term impacts on these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs from the new line development (-2).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on eight European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.5 Coolkeeragh – Limavady – Coleraine 110 kV Uprating – Project 5

Coolkeeragh - Limavady - Coleraine 110 kV Uprating – Transmission Line Restring / Uprate

It is proposed to uprate all existing overhead lines between Coolkeeragh, Limavady and Coleraine. The study area has been determined in GIS; this includes an uprating area. For assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there are three SACs, namely Binevenagh, River Faughan and Tributaries, and River Roe and Tributaries. Lough Foyle, located to the west of the study area, is designated as a SPA and a RAMSAR site, this is the only instance of these designations within the study area. Within the study area there are 15 ASSIs, namely Aghanloo Wood, Ballyrisk More, Binevenagh, Bovevagh, Brockagh Quarry, Castle River Valley, Coolnasillagh, Errigal Glen, Gortcorbies, Gortycavan, Lough Foyle, Loughermore Mountain, River Faughan and Tributaries, River Roe and Tributaries, and Smulgedon. There are two National Nature Reserves, Binevenagh NNR and Roe Estuary NNR, within the study area. The Lough Foyle RSPB Reserve is the only RSPB Reserve in the study area. In total, 38 SLNCIs are crossed by the study area, and 26 Salmonid Rivers intersect the study area.

Population & Human Health - There are 20 main settlements within the study area. The study area has a mean population density of 17.3 people / km^2. Within the study area there are two Neighbourhood Renewal Areas, namely Limavady and Waterside, and areas of lower perceived health within Eglinton, Carrowclare and Limavady.

Geology, Soils & Land Use – The study area covers c. 641 km^2 and is composed of broadleaf woodland (7%), coniferous woodland (10%), arable land (17%), improved grassland (28%), semi-natural grassland (28%), mountain, heath and bog (16%), coastal land (1%), suburban land (2%) and saltwater (2%). Within the study area there are two ASSIs designated for geological features, namely Bovevagh and Loughermore Mountain. There are 192 ancient woodland areas and 55 Forest Services sites scattered throughout the study area. Throughout the study area, 61 areas of unstable ground have been identified, as well as 14 upland areas and seven areas comprised of landslide deposits. Within the study area 23 PPC sites and 666 historical sites that have the potential of being contaminated land have been identified. There are no quarries located within the study area.

Water – Within the study area there are 26 WFD Rivers, of which 15 are of Good ecological WFD status **(**Macosquin River (Macosquin), Articlave River, Shinney Water, Agivey River (Bovagh), Mettican River, Brockagh Water, Agivey River (Garvagh), Curly River, Castle River, River Roe (Ballycarton), Gelvin River (Benview), Gelvin River (Lenamore), River Roe (Limavady), Faughanvale River and Muff River), nine are of Moderate WFD status (Macosquin River, Aghadowey River, Bovevagh River, Cullion Burn, Burntollet River (Lougheramore), Burntollet River (Ness Wood), Bessbrook (Foyle) River, Ballykelly River and Faughan River (Carnmoney)) and two are of Moderate Ecological Potential (Bann Brook and Lower River Bann (Coleraine). There are three transitional / coastal waterbodies within the study area, of which one is of Good ecological WFD status (Lough Foyle), one is of Moderate status (Upper Foyle) and one is of Moderate Ecological Potential (Foyle Harbour and Faughan). Within the study area there are four drinking water rivers, namely Articlave River, Bann Brook, Macosquin River and River Faughan. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Ballykelly, City of Derry Airport, Limavady, Londonderry, Macosquin and Bonannaboigh areas. There are significant regions of 0.5 % AEP coastal flood risk located along the Lough Foyle coastline within the north-west of the study area. There are several areas of 0.5% AEP pluvial flood risk across the study area, with significant regions located in the Ballykelly, Eglinton, Strathfoyle, Londonderry and Greysteel areas in the north-west of the study area.

Air – There are no AQMAs or other known significant air quality issues within the study area.

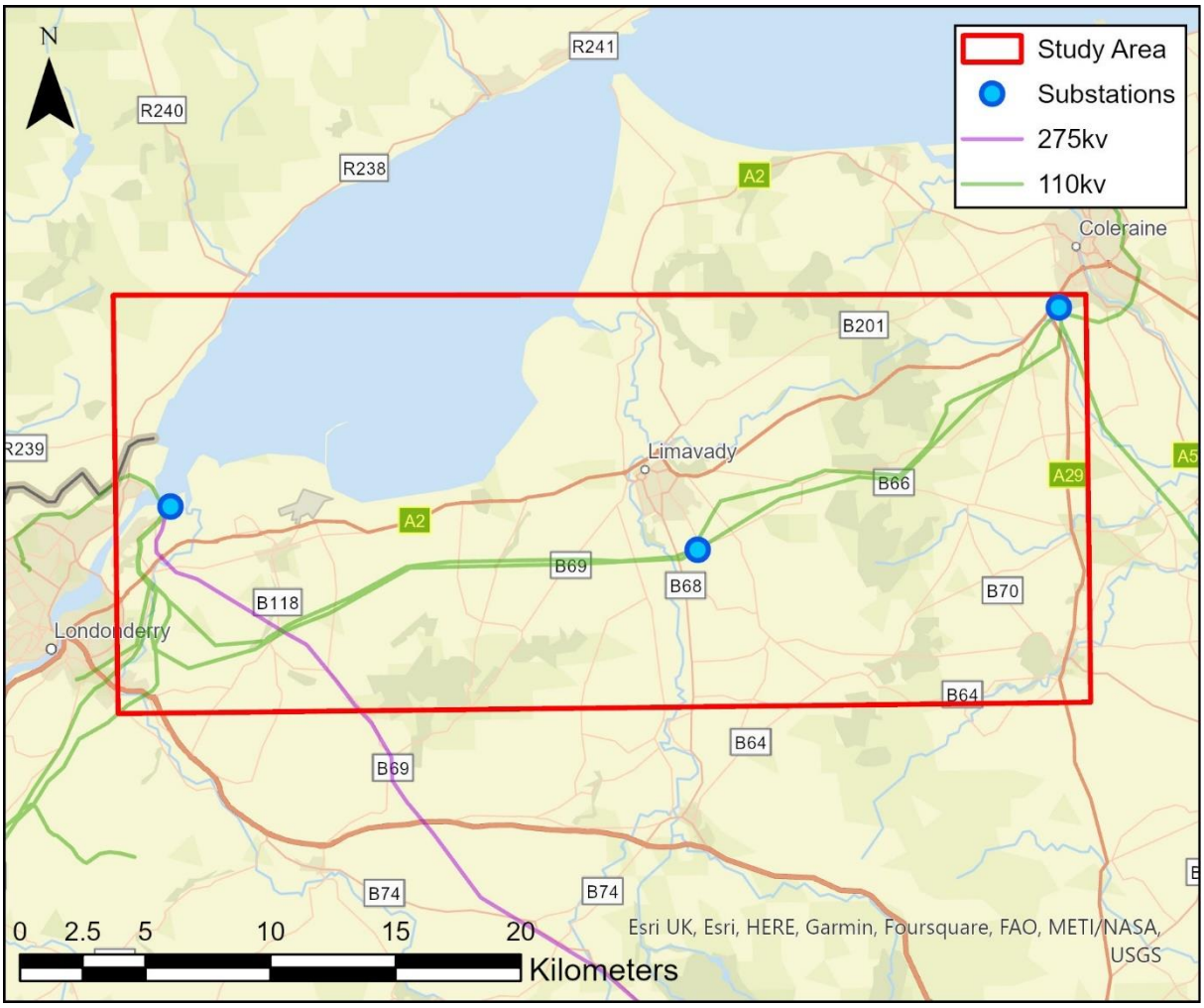
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Ballykelly, City of Derry Airport, Londonderry, Limavady, Macosquin and Bonannaboigh areas. There are significant regions of 0.5 % AEP climate change coastal flood risk located along the Lough Foyle coastline within the northwest of the study area. There are several areas of 0.5% AEP climate change pluvial flood risk across the study area, with significant regions located in the Limavady, Eglinton, Strathfoyle, Londonderry and Greysteel areas in the northwest of the study area.

Material Assets – Within the study area there are 3 km of dual carriageway, 74 km of A roads, 117 km of B roads, 370 km of minor roads, and 110 km of <4M tarred roads. There is approximately 28 km of railway that crosses the study area. There is one airport land contained within the study area, namely City of Derry Airport. Within the study area there is one gas transmission line (NW Pipeline), and ten electricity transmission lines, including twelve 110 kV overhead lines and two 275 Kv overhead lines. Within the study area there is 352 km^2 of agricultural land, this is comprised of 67.7 km^2 of non-irrigated arable land, 12.6 km^2 of complex cultivation patterns, 2.74 km^2 of land principally occupied by agriculture and 269 km^2 of pastures.

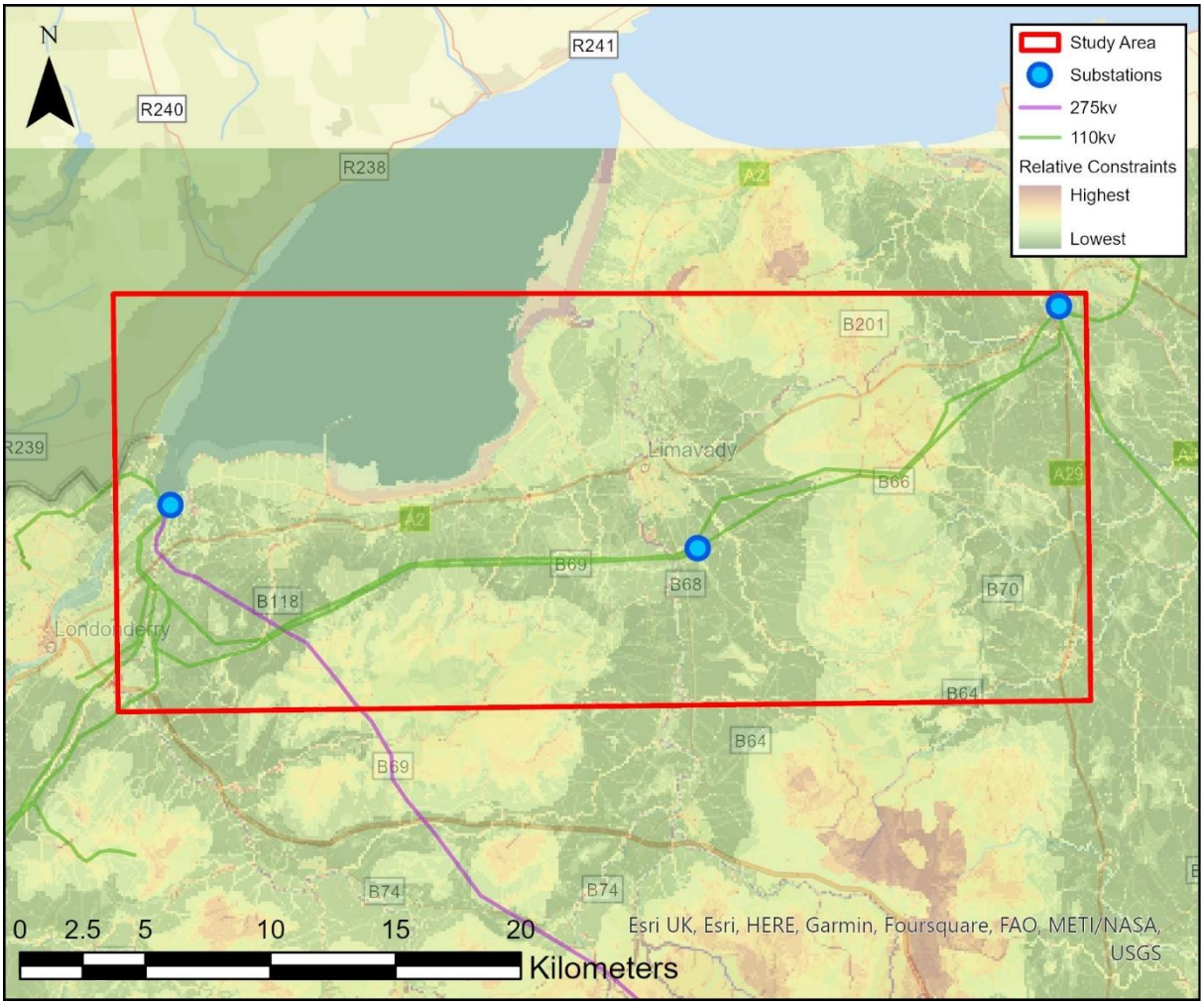
Cultural, Architectural & Archaeological Heritage – Within the study area there are 555 SMRs and 68 Scheduled Zones. There are 438 Listed Buildings, 570 Industrial Heritage areas, 589 Defence Heritage areas, five Areas of Archaeological Potential and 11 Parks and Gardens within the study area.

Landscape & Visual Amenity – Within the study area there are 12 LCAs, of which one is of Low sensitivity (Loughermore Hills), nine are of Medium / High sensitivity (Binevenagh, Burngibbagh and Drumahoe, Derry Slopes, Eastern Binevenagh Slopes, Foyle Valley, Garvagh Farmland, Lough Foyle Alluvial Plain, Sperrin Foothills and Roe Basin), and two are of High sensitivity (Magillian Lowlands and Coleraine Farmland) to development. The study area also contains one National Trust Land (Rough Fort), one AONB (Binevenagh) and one Country Park (Roe Valley).

Study Area


N
Study Area
Substations
275kv
110kv
R241
R240
R238
A2
Coleraine
B201
R239
Limavady
A29
B66
A2
B69
B68
B70
B118
Londonderry
B64
B64
B69
B74
B74
0 2.5 5 10 15 20
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS

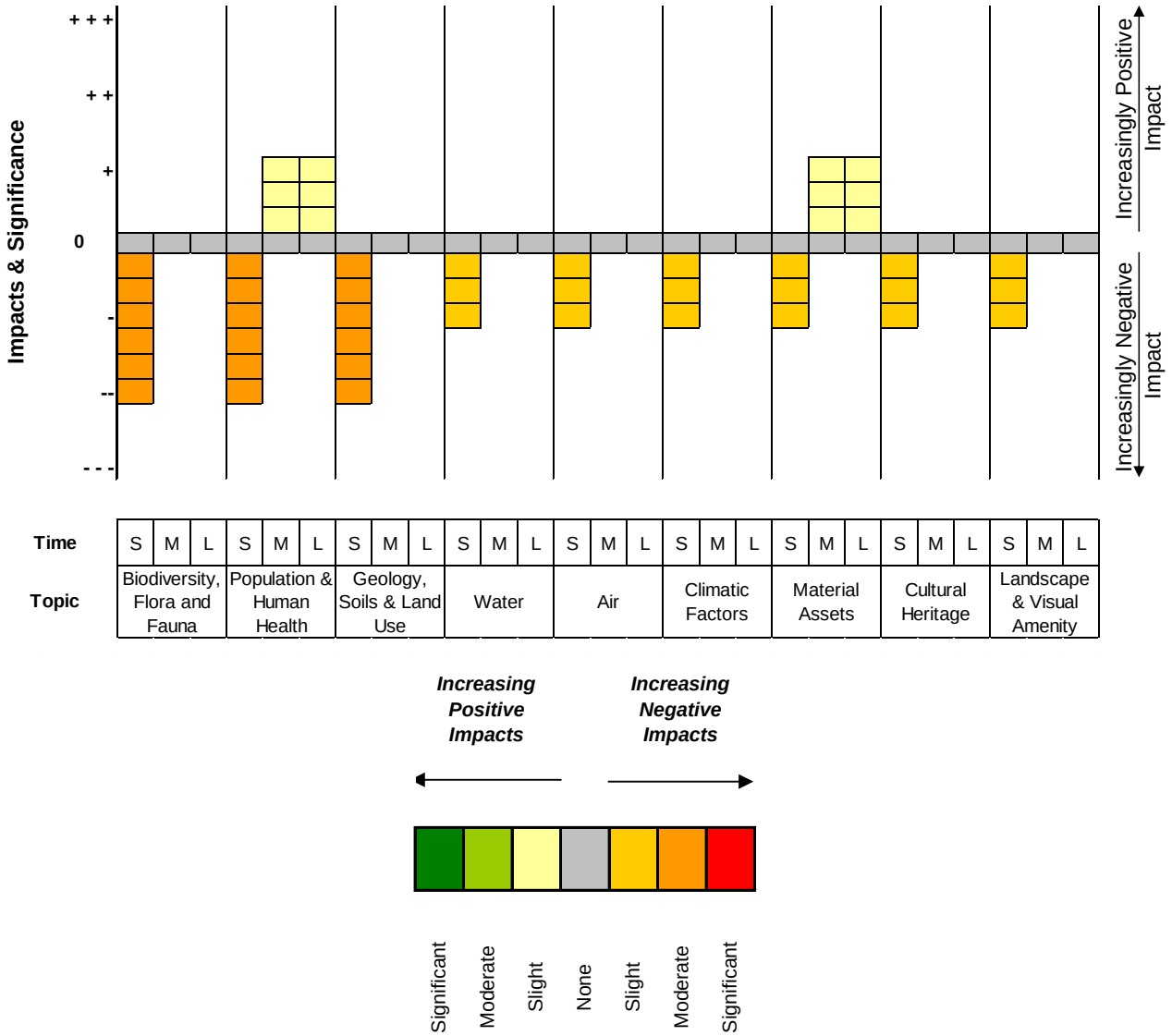
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-2	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-1	0	0
Landscape & Visual Amenity (L)	-1	0	0

Summary Chart of Potential Effects



Key Conclusions:

Development of the 110 kV restring of all existing overhead lines between Coolkeeragh, Limavady and Coleraine has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following the restring. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population areas and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas

in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the restring, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail and existing electricity transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following the restring. There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within an AONB, Country Park, and sensitive LCA (-1); there are unlikely to be any further medium or long term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting.

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on four European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.6 Drumnakelly – Tamnamore 110 kV Uprating – Project 6

Drumnakelly - Tamnamore 110 kV Uprating – Transmission Line Underground Cables and Restring / Uprate

It is proposed to underground the overhead line through Killyman village and replace with cable in the road. The remainder of both overhead lines between Tamnamore and Drumnakelly would be refurbished. The wider study area, least cost line and an uprate corridor have been determined within GIS. For assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there is one SAC (Peatlands Park), one SPA (Lough Neagh and Lough Beg), and one RAMSAR site (Lough Neagh and Lough Beg). There are seven ASSIs within the study area, namely Brackagh Bog, Derryvore, Drumcrow, Lough Gullion, Lough Neagh, Peatlands Park and Selshion. There are three National Nature Reserves within the study area, namely Brackagh Bog, Lough Neagh Islands, and Mullenakill and Annagarriff. In total, ten SLNCIs are located within the study area. Within the study area there are five Salmonid rivers (Ballyartim River, Callan River, River Blackwater, Torrent River and Upper Bann), and two Salmonid lakes (Gullion Lough and Neagh Lough). The Bann Freshwater Pearl Mussel Catchment is located within the study area.

Population & Human Health - There are 26 main settlements within the study area. The mean population density of the study area is 19.5 people / km^2. Within the study area there are two Neighbourhood Renewal Areas (Coalisland and Portadown North West), two peace lines (Bann Boulevard and Corcrain Road), and areas of lower perceived health within Portadown, east of Annaghmore and south of Maghery.

Geology, Soils & Land Use – The study area covers approximately 269 km^2 and is comprised of broadleaf woodland (8%), arable land (3%), improved grassland (23%), semi-natural grassland (50%), mountain heath and bog (3%), freshwater (8%), and suburban land (4%). There are 92 areas of ancient woodland scattered

throughout the study area. Within the study area there are no active quarries, however, there are eight abandoned mines, which are mainly located in the south-east of the study area. The study area contains 14 PPC sites and 348 areas of historic land use that have the potential of being contaminated land.

Water – Within the study area there are 15 WFD rivers (Annagh River, Ballybay River, Ballymartin Water, Callan River (Derryscollop), Cusher River (Tandragee), Derrycaw Stream, Kilmore Tributary, Lough Neagh Peripherals, River Blackwater (Argory), River Blackwater (Benburb), River Rhone (Dungannon), Tall River (Derrycrew), Tall River (Richhill), Tamnamore Stream and Torrent River); of these, one is of Good WFD ecological status (River Blackwater (Benburb), while the remaining 14 are of less than Good status. There are two WFD lakes within the study area, namely Lough Gullion and Lough Neagh, which are of Bad and Poor ecological potential WFD status, respectively. There are 365 river segments within the study area. Lough Neagh Craigavon is the only drinking water lake within the study area. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Loughgall, The Argory, The Birches, Charlemot, Ardess, Portadown, Tamnamore and Ballynakilly areas, as well as the settlements on the Lough Neagh shores of Maghery, Bannfoot, Derrytrashan and Coney Island in the north. There are numerous areas of significant 0.5% AEP pluvial flood risk scattered throughout the study area.

Air – There are two AQMAs within the study area, namely Armagh City, Banbridge and Craigavon Borough Council AQMA and the Moy AQMA.

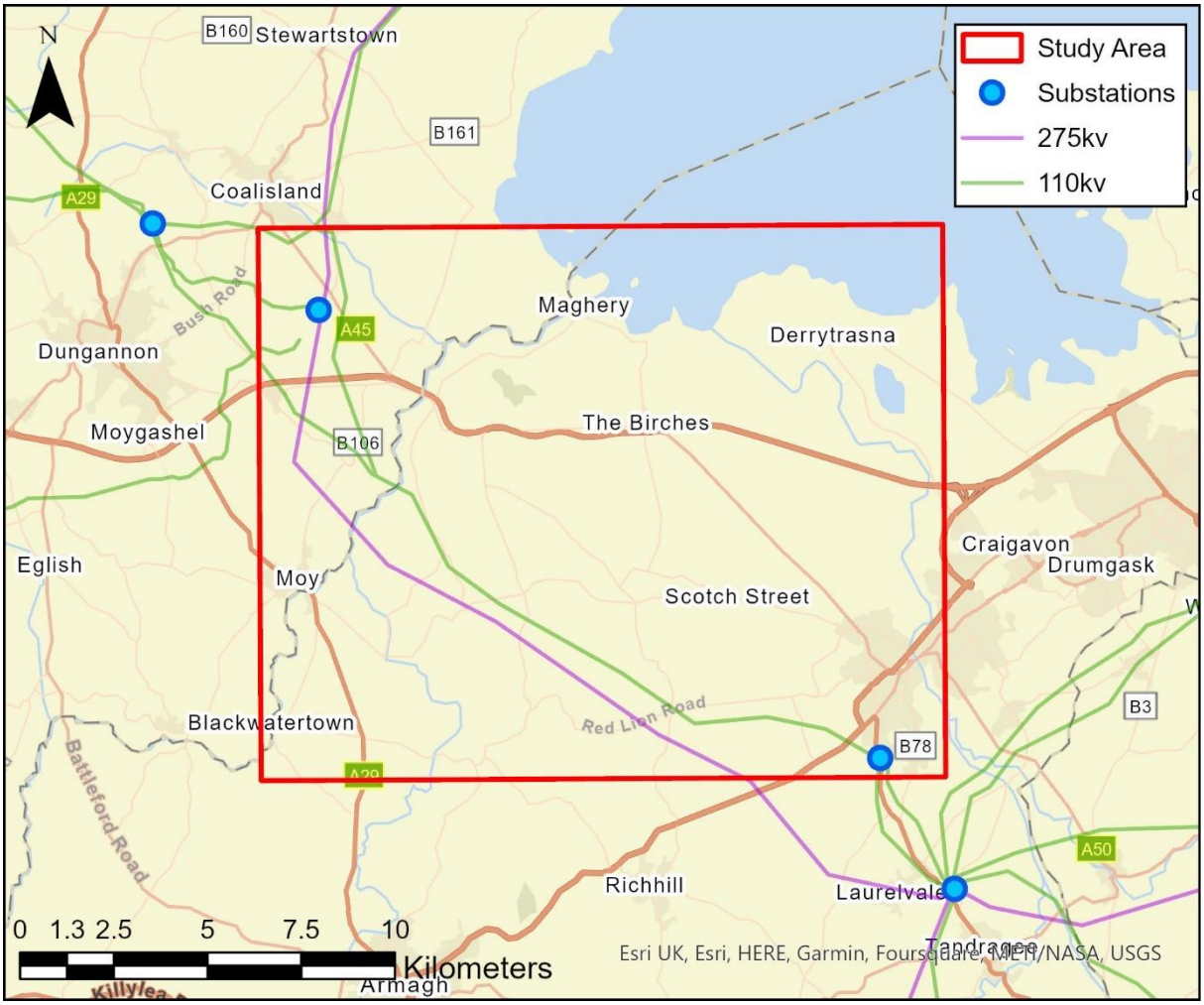
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Loughgall, The Argory, The Birches, Charlemot, Ardess, Kilmore, Portadown, Tamnamore and Ballynakilly areas, as well as the settlements on the Lough Neagh shores of Maghery, Bannfoot, Derrytrashan and Coney Island in the north. There are numerous areas of significant 0.5% AEP climate change pluvial flood risk scattered throughout the study area.

Material Assets – There are 25 km of motorway, 36 km of A road, 90 km of B road, 108 km of minor road, and 241 km <4M Tarred Road within the study area. Approximately 4.8 km of railway line runs through the study area. Within the study area there is a gas transmission pipeline of Gas to the West, and 22 electrical transmission lines, of which 20 are 110 kV OHLs and two are 275 kV OHLs. Within the study area there is 217 km^2 of agricultural land, comprised of 0.73 km^2 of fruit trees and berry plantations, 5.6 km^2 of complex cultivation patterns, 1 km^2 of land principally occupied by agriculture, and 210 km^2 of pastures.

Cultural, Architectural & Archaeological Heritage – Within the study area there are 157 SMRs (e.g., historic settlements, earthern ramparts, crannogs, holy wells) and 20 Scheduled Zones (e.g., crannogs, Coalisland Canal, raths and WWII pillboxes). The study area contains 281 Listed Buildings, 294 Industrial Heritage areas (e.g., several bridges, flax mills, brickfields, windmills) 45 Defence Heritage areas (e.g., Derrygally House, Charlemont Fort, Portadown ROC post) and two Areas of Archaeological Potential (Scotch Street and The Birches). There are also six Parks and Gardens within the study area (Ardress, Coney Island, Eden Villa, Loughgall Manor House, Summer Island and The Argory).

Landscape & Visual Amenity – The study area contains one Country Park (Peatlands Park), three National Trust Lands (Ardress House, Argory and Coney Island), and five LCAs. Of these LCAs, two are of High sensitivity (Lough Neagh Peatlands LCA and Upper Bann Floodplain LCA), and three are of Medium / High sensitivity (Craigavon Plateau LCA, Dungannon Drumlins and Hills LCA, and Loughgall Orchard Belt LCA) to development.

Study Area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B160
Stewartstown
B161
A29
Coalisland
Bush Road
A45
Maghery
Derrytrasna
Dungannon
Moygashel
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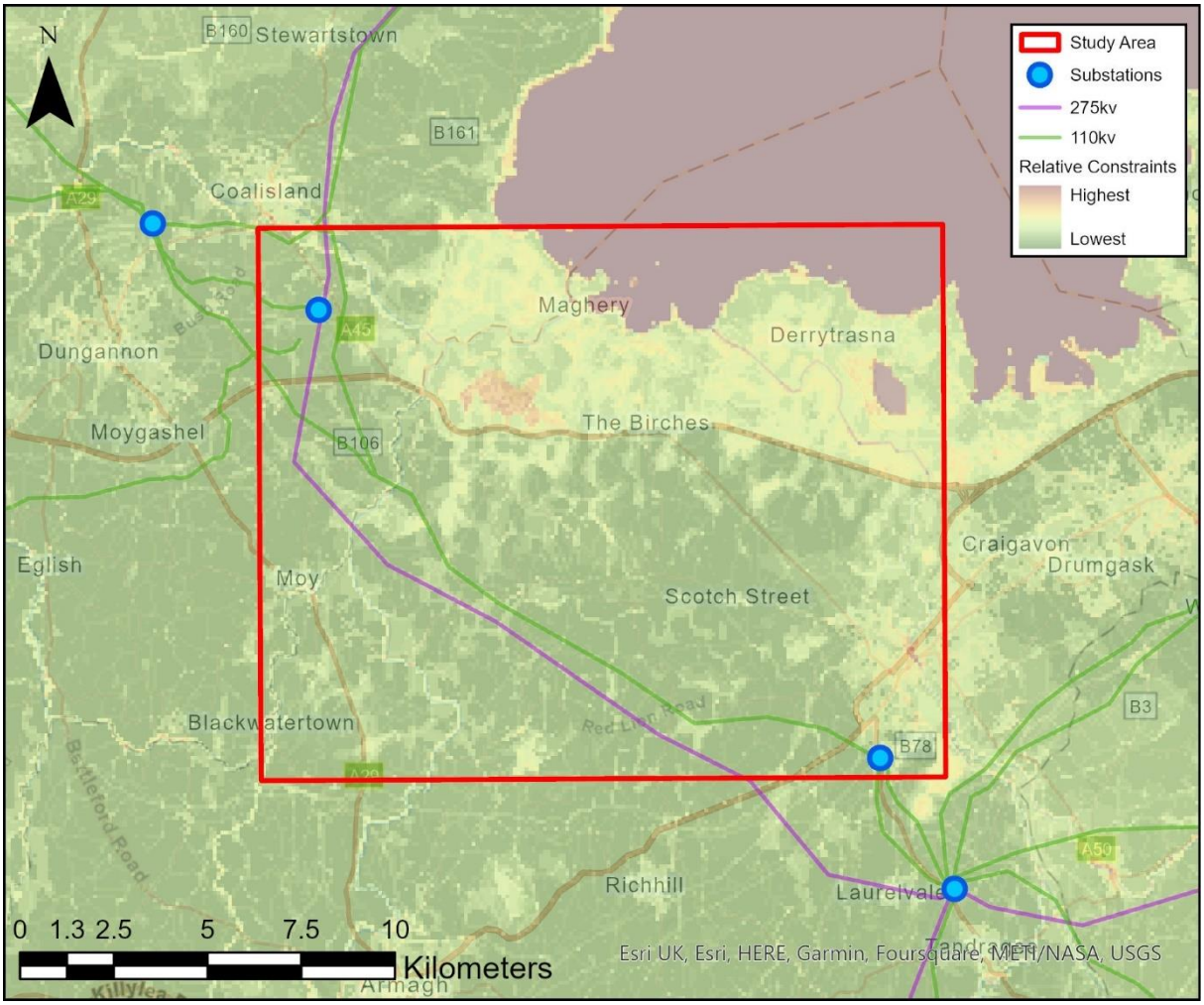
The Birches
Eglish
Moy
Scotch Street
Craigavon
Drumgask
Blackwatertown
Red Lion Road
B78
B3
Battleford Road
A50
Richhill
Laurelvale
Tandragee
Armagh
Killylea
Study Area
Substations
275kv
110kv
0 1.3 2.5 5 7.5 10
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

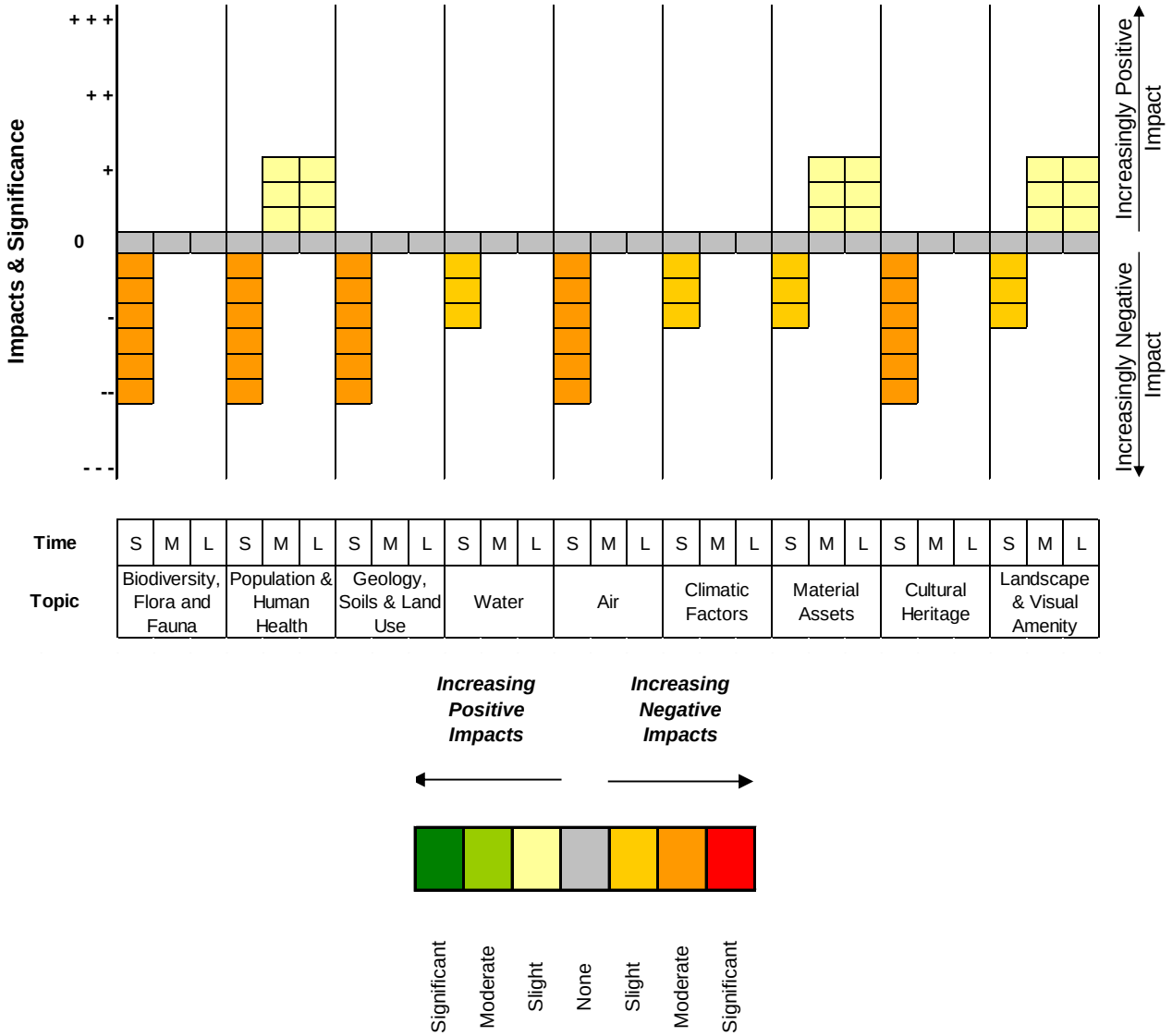
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-2	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-2	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-2	0	0
Landscape & Visual Amenity (L)	-1	+1	+1

Summary Chart of Potential Effects



Key Conclusions:

Development of the 110 kV restring of existing overhead lines between Drumnakelly and Tamnammore, and undergrounding of the overhead line through Killyman village, has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring and underground cabling (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the

potential for short-term, temporary, construction phase, slight negative impacts on Air during the restring and underground cabling, including within sensitive areas (-2); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring and underground cabling from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail, agricultural land, and existing electricity transmission infrastructure during the restring and underground cabling (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1), and for direct, temporary to permanent, impacts on a small number of features during the undergrounding of cables on the setting of these features (-2); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within a National Trust land, and sensitive LCA (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting. The undergrounding of the line through Killyman has the potential for positive impacts on the landscape and visual amenity of these areas in the medium- to long-term (+1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.7 Ballylumford – Ballyvallagh – Uprating – Project 7

Ballylumford – Ballyvallagh – Transmission Line Restring / Uprate

It is proposed to uprate the existing overhead lines between Ballylumford and Ballyvallagh. The wider study area and uprate corridor have been determined in GIS. For assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there is one SAC (North Channel), one SPA (Larne Lough), and one RAMSAR site (Larne Lough). There are seven ASSIs that are intersected by the study area, namely Carneal, Glynn Woods, Kilcoan, Larne Lough, Newlands, Portmuck and The Gobbins. In total, there are five SLNCIs within the study area, namely Ardboley, Keeran Moss, Slimero Mountain Wet Grassland, West of Mutton Burn and Woodland West of Black Hill. The study area also contains one National Nature Reserve (Swan Island) and one RSPB Reserve (Larne Lough Islands). Four salmonid rivers run through the study area, namely Glynn/Glenow River Lower and Glynn/Glenow River Upper and Larne River Lower and Larne River Middle.

Population & Human Health - There are ten main settlements within the study area, namely Ballycarry, Ballystrudder, Crosshill, Glenow, Glynn, Larne, Magheramorne, Mill Bay, Mounthill and Mullaghboy. The mean population density of the study area is 20.4 people / km^2. The study area contains no Neighbourhood Renewal Areas or peace lines. There are areas of lower perceived health located around Larne.

Geology, Soils & Land Use – The study area covers approximately 96 km^2 and is comprised of broadleaf woodland (6%), arable land (33%), improved grassland (33%), semi-natural grassland (1%), mountain heath and bog (4%), coastal land (5%), urban / suburban land (5%) and saltwater (10%). Within the study area

there are four ASSIs designated for geological features, namely Carneal, Kilcoan, Portmuck and The Gobbins. Within the study area there are 26 ancient woodland areas predominantly located near Larne, and 3 Forest Service sites, which are located to the west of Ballycarry of Woodburn. There are three identified areas of unstable ground to the north-west of Ballycarry comprised of peat, as well as six upland areas in the south-west of the study area, and one area comprised of landslide deposits to the south-east of Gleno. Within the study area five PPC sites (Ballylumford Power Station, Bombardier Aerospace, Larne WWTW Sludge Thickening Plant, Anderson Haulage Ltd, and Crosshill Quarry) and 173 historical sites that have the potential of being contaminated land have been identified (e.g., former railway land, mineral workings, former docklands/dockyards). Within the study area there are six abandoned mines, and one salt mine is located south of Ballycarry.

Water – Within the study area there are four WFD Rivers, of which two are of Good WFD status (Larne (Inver) River and Kilroot River), one is of Moderate ecological potential (Copeland Water) and one is of Moderate WFD status (Glynn River). There are 245 river segments within the study area. Within the study area there are four transitional / coastal WFD water bodies, of which one is of Good WFD status (North Cannel), one is of Moderate ecological potential (Larne Lough North) and two are of Moderate status (Larne Lough Mid and Larne Lough South). Within the study area there are two drinking water rivers, namely Copeland Water and Glynn River, as well the Browns Bay Bathing Water Protected Area. There are six shellfish licensed areas within the study area, namely Barney's Point, Magheramourne, Mill Bay, Off White Key, Outer Mill Bay and White Quay. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Glenoe, Lough Mourne, Ballycarry and Browns Bay Road (Island Magee) areas. Within the study area there is one significant area of 0.5% AEP coastal flood risk which encompasses the Larne Lough and its shoreline, as well as the Island Magee coastline. There are several areas with significant 0.5% AEP pluvial flood risk within the study area, including the Larne, Millbrook, Glenoe, Glynn, Beltoy, Ballycarry and Island Magee areas.

Air – There are no AQMAs or other known air quality issues within the study area.

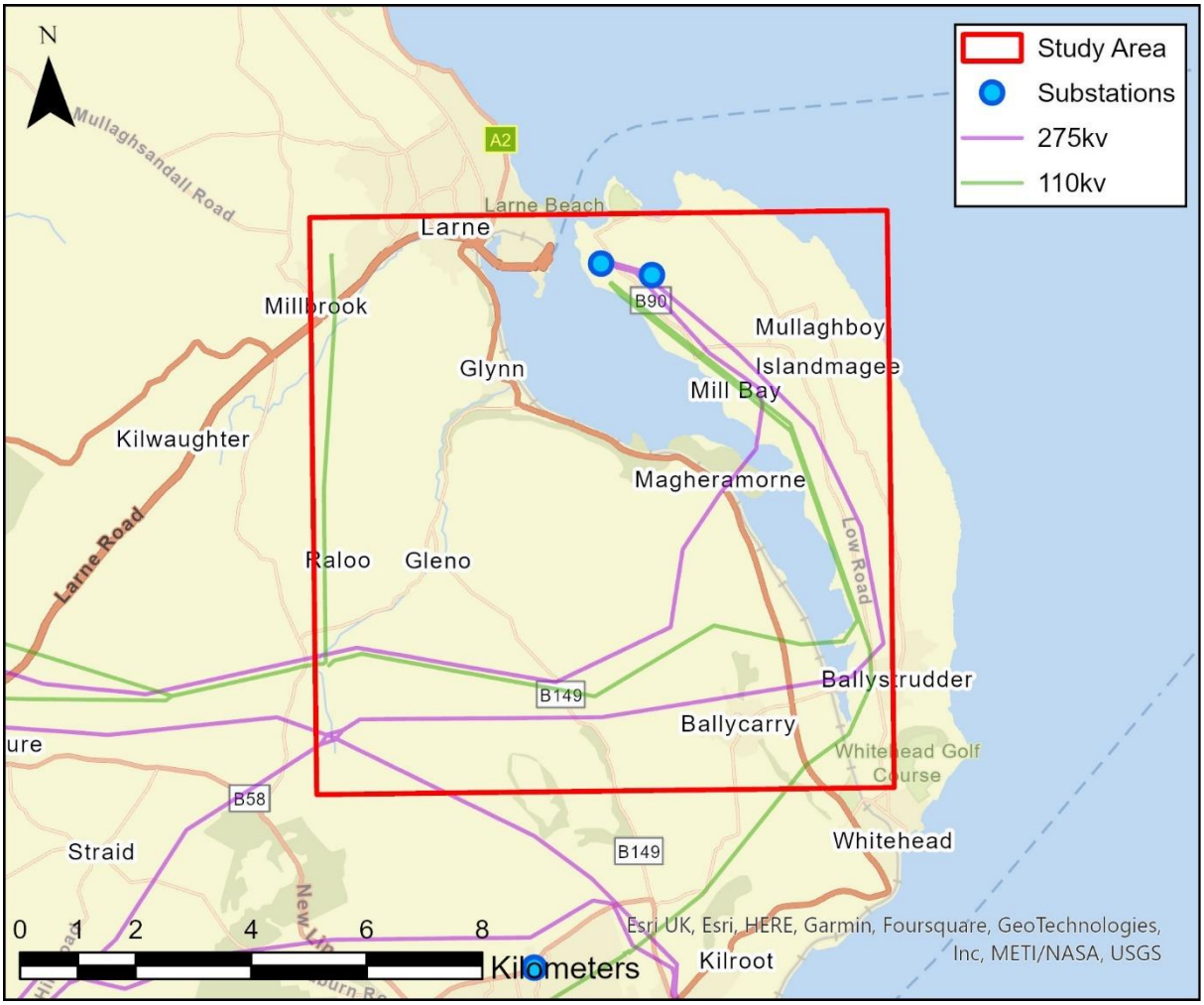
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Glenoe, Lough Mourne, Ballycarry and Browns Bay Road (Island Magee) areas. Within the study area there is one significant area of 0.5% AEP coastal flood risk, which encompasses Larne Lough and its shoreline, as well as the Island Magee coastline. There are several areas with significant 0.5% AEP climate change pluvial flood risk within the study area, including the Larne, Millbrook, Glenoe, Glynn, Beltoy, Ballycarry and Island Magee areas.

Material Assets – Within the study area there are 5 km of dual carriageway, 15 km of A roads, 43 km of B roads, 81 km of minor roads, and 12 km <4M tarred roads. Approximately 21 km of railway line crosses through the study area. The PNG Transmission gas line runs through the study area, as well as sixteen electricity transmission lines, of which nine are 110 kV OHLs and seven are 275 kV OHLs. Within the study area there is 76.3 km^2 of agricultural land, comprised of 1.2 km^2 of non-irrigated arable land, 0.14 km^2 of land principally occupied by agriculture and 75 km^2 of pastures.

Cultural, Architectural & Archaeological Heritage – Within the study area there are 143 SMRs (e.g., standing stones, medieval churches, historic settlements) and 15 Scheduled Zones (e.g., raths, heavy anti-aircraft battery, mounds). The study area contains 268 Industrial Heritage areas (e.g., Bleach and Flour Mills, Corn and Flax Mills, former shipbuilding sites), 57 Defence Heritage areas (e.g., Redhall and Larne Coastal battery), and one Area of Archaeological Potential (located near Ballycarry). There are also three Parks and Gardens located within the study area, namely Drumalis, Red Halla and Magheramorne (Ballylig). There are 175 Listed Buildings within the study area.

Landscape & Visual Amenity – Within the study area there are five LCAS of Medium / High sensitivity to development, namely Carrickfergus Farmed Escarpment LCA, Carrickfergus Upland Pastures LCA, Island Magee LCA, Larne Coast LCA and Larne Ridgeland LCA. There are also two National Trust Lands within the study area, namely Glenoe and Islandmagee.

Study Area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Substations
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110kv
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Millbrook
B90
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Mill Bay
Kilwaughter
Magheramorne
Larne Road
Raloo
Gleno
Low Road
B149
Ballystrudder
Ballycarry
ure
Whitehead Golf Course
B58
Straid
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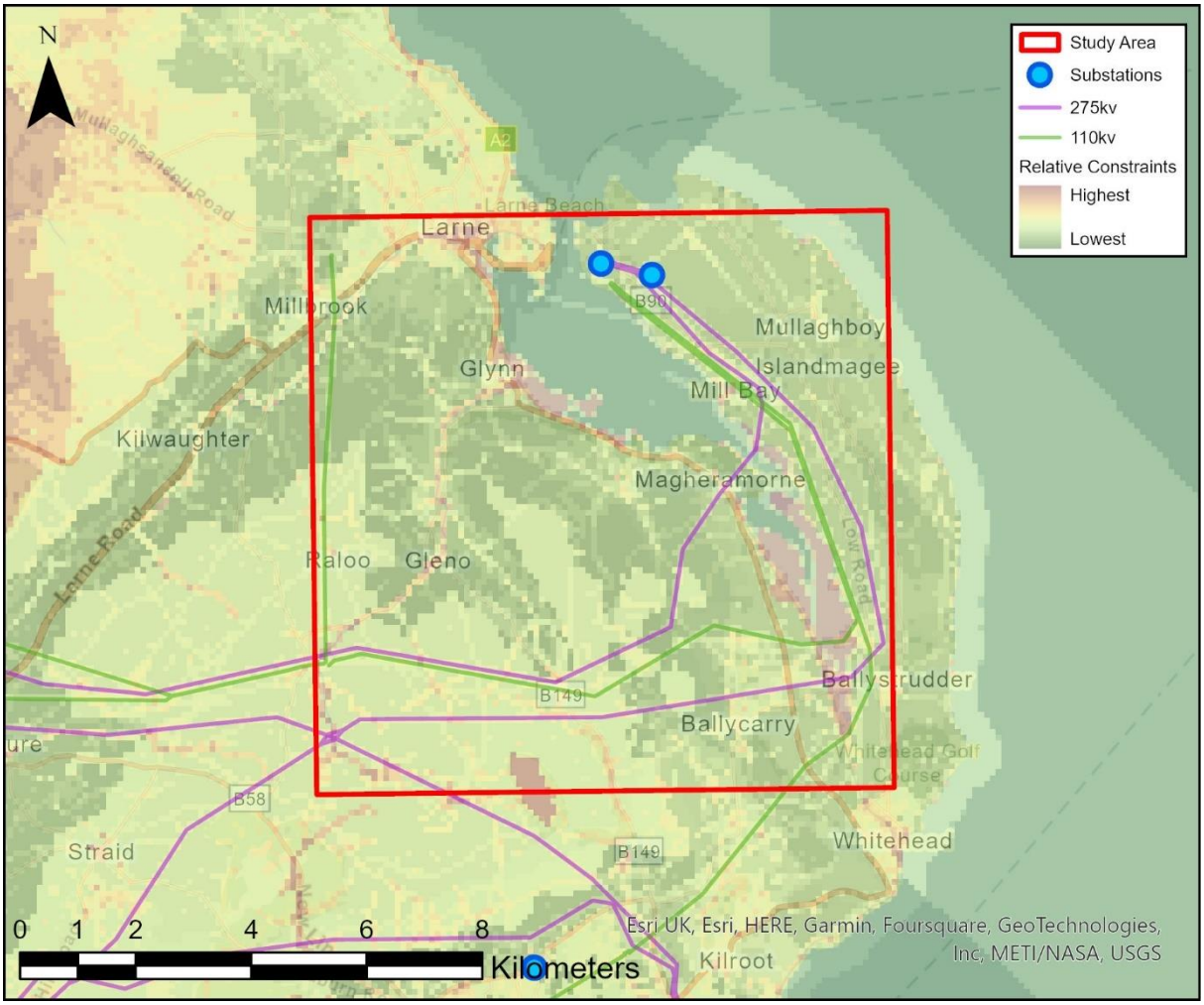
Kilroot

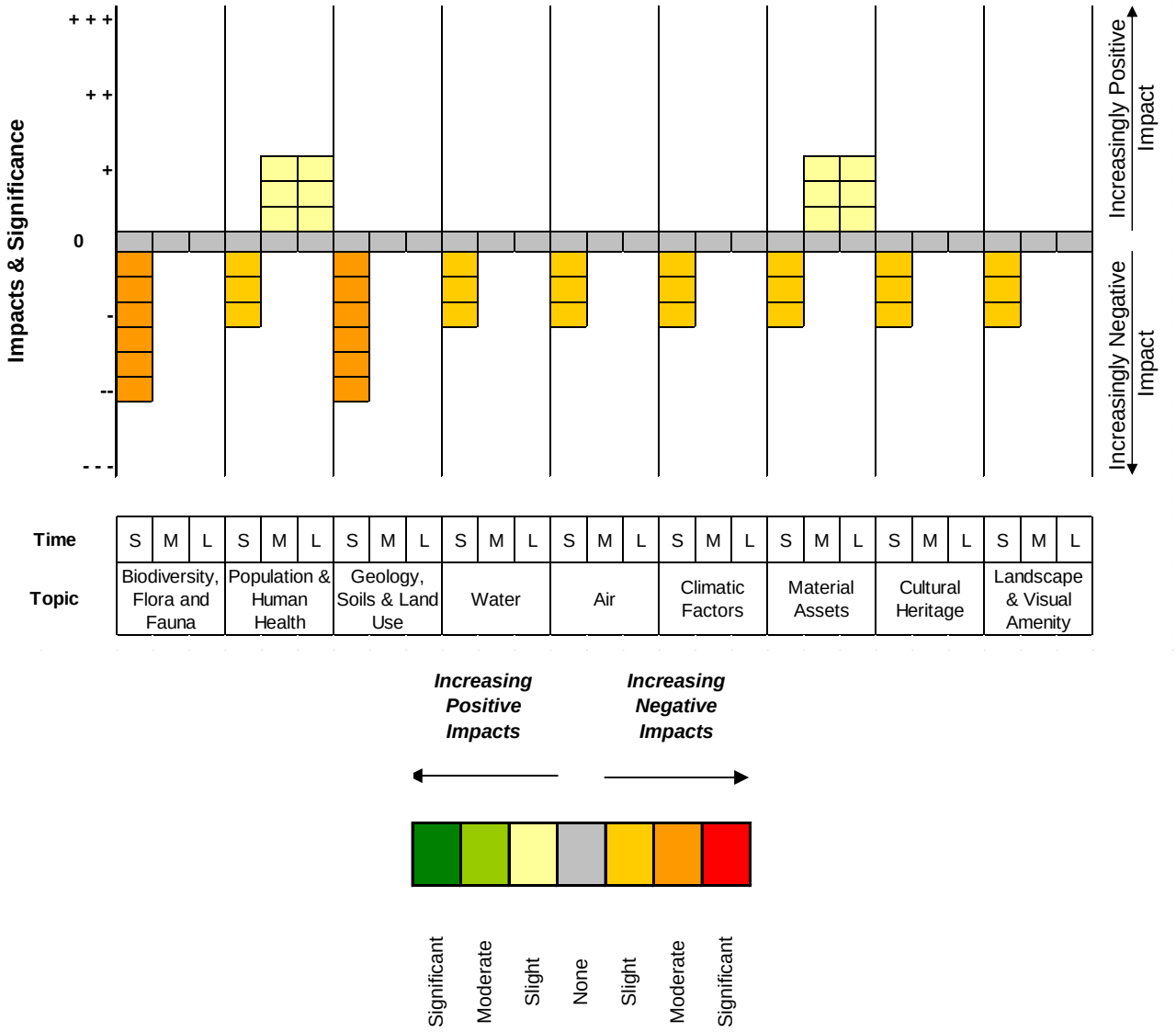
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-1	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-1	0	0
Landscape & Visual Amenity (L)	-1	0	0

Summary Chart of Potential Effects



Key Conclusions:

Development of the restring of existing overhead lines between Ballylumford and Ballyvallagh has the potential for short-term, temporary, construction phase, slight to moderate indirect negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on the local Population and Human Health, not within high population density or social sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during

the restring, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.8 New NW 110 kV Switching Station – Project 8

New NW 110 kV Switching Station – New Substation and New / Uprate Transmission Line

It is proposed to install a new 110 kV substation south of Derry (Mobuoy area) marshalling several 110 kV circuits together. This potential option is at an early stage, with little detail as yet. This includes a wider study area determined in GIS and a 50% least cost area for the proposed substation development.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – The River Faughan and Tributaries are designated as an SAC and ASSI; this is the only instance of either designation within the study area. The River Faughan is also the only Salmonid River within the study area.

Population & Human Health - There are two major settlements within the study area, namely Derry / Londonderry City and Maydown. The mean population density of this study area is 23.3 people / km^2. There are no areas of lower perceived health, Neighbourhood Renewal Areas or peacelines located within the study area.

Geology, Soils & Land Use – The study area covers approximately 5 km^2, and is comprised of broadleaf woodland (12%), arable land (17%), improved grassland (37%), semi-natural grassland (25%), mountain heath and bog (2%), suburban land (5%) and freshwater (3%). There is one area of ancient woodland within the study area, located to the south of the study area. There are 28 areas of historic land use that have the potential of being contaminated identified throughout the study area (e.g., City Industrial Waste, mineral workings, waste recycling, treatment and disposal sites). There are no quarries within the study area, however, one is located off the Gortree Road, c. 200 m east of the south-east border of the study area.

Water – There is one WFD River located within the study area, namely the River Faughan (Carmoney) which is of Moderate WFD status, and two river segments (GBNI0201333 and UKGBNI0204148) are located within the study area. Within the study are there is one Drinking Water River, the River Faughan. There are significant areas of 1% AEP fluvial flood risk located along the course of the River Faughan. Within the study

area there is one significant area of 0.5% AEP coastal flood risk, which encompasses a section of the River Faughan to the north and a water body located between the Mobuoy Road and the River Faughan.

Air – There are no AQMAs or other known air quality issues within the study area.

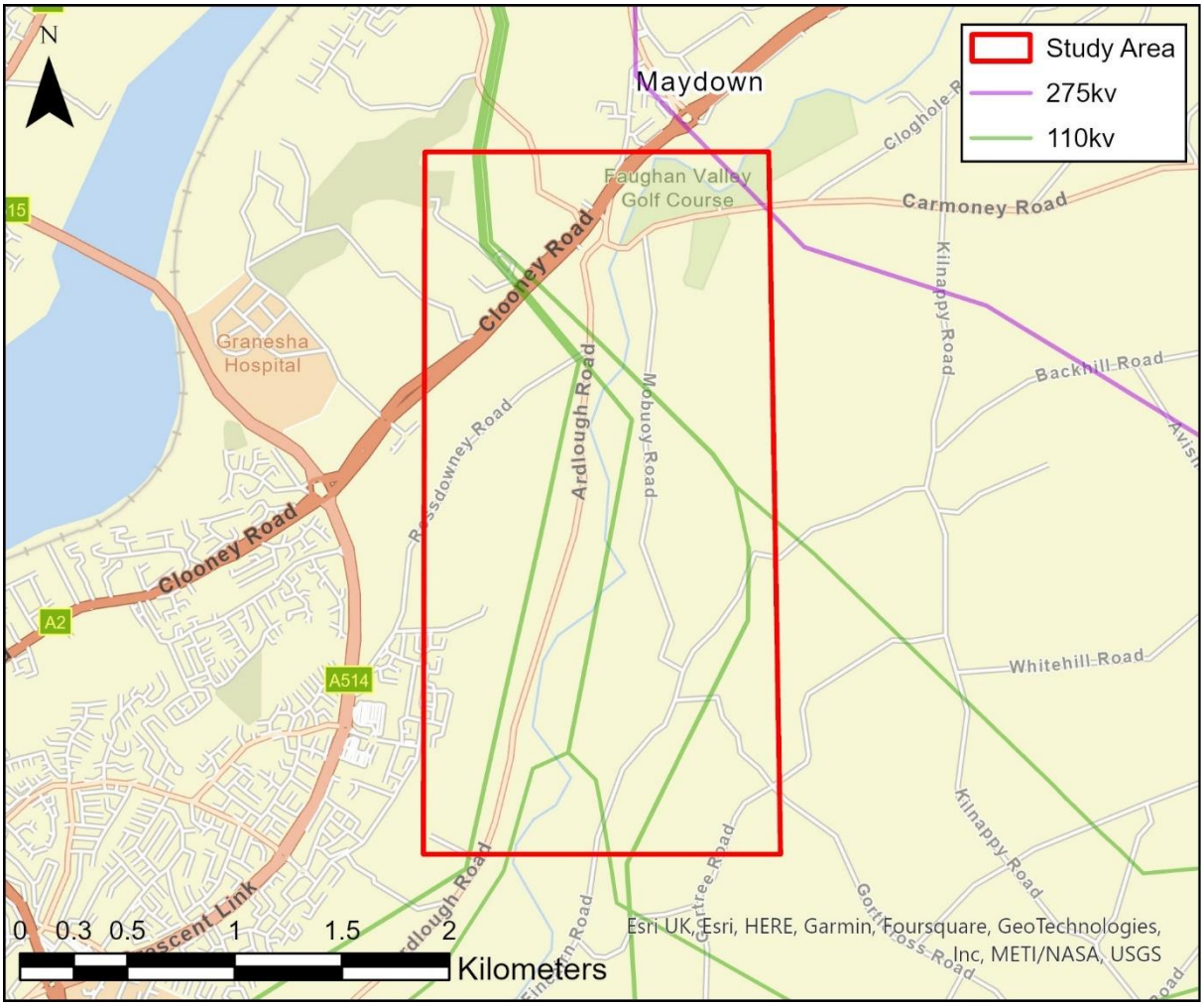
Climatic Factors – There are significant areas of 1% AEP climate change fluvial flood risk located along the course of the River Faughan. Within the study area there is one significant area of 0.5% AEP climate change coastal flood risk, which encompasses a section of the River Faughan to the north and a water body located between the Mobuoy Road and the River Faughan. There are several areas with significant 0.5% AEP pluvial flood risk within the study area, located around Lough Enagh (Eastern) and along the River Faughan, particularly to the east of the channel.

Material Assets – There are 1 km of dual carriageways, 1 km of <4M tarred roads and 10 km of minor roads within the study area. There are twelve 110 kV electricity transmission lines and there are two 275 kV OHLs within the study area, Within the study area there is 4.5 km^2 of agricultural land, this is comprised of 0.23 km^2 of non-irrigated arable land, 0.12 km^2 of complex cultivation patterns, 0.47 km^2 of land principally occupied by agriculture and 3.7 km^2 of pastures.

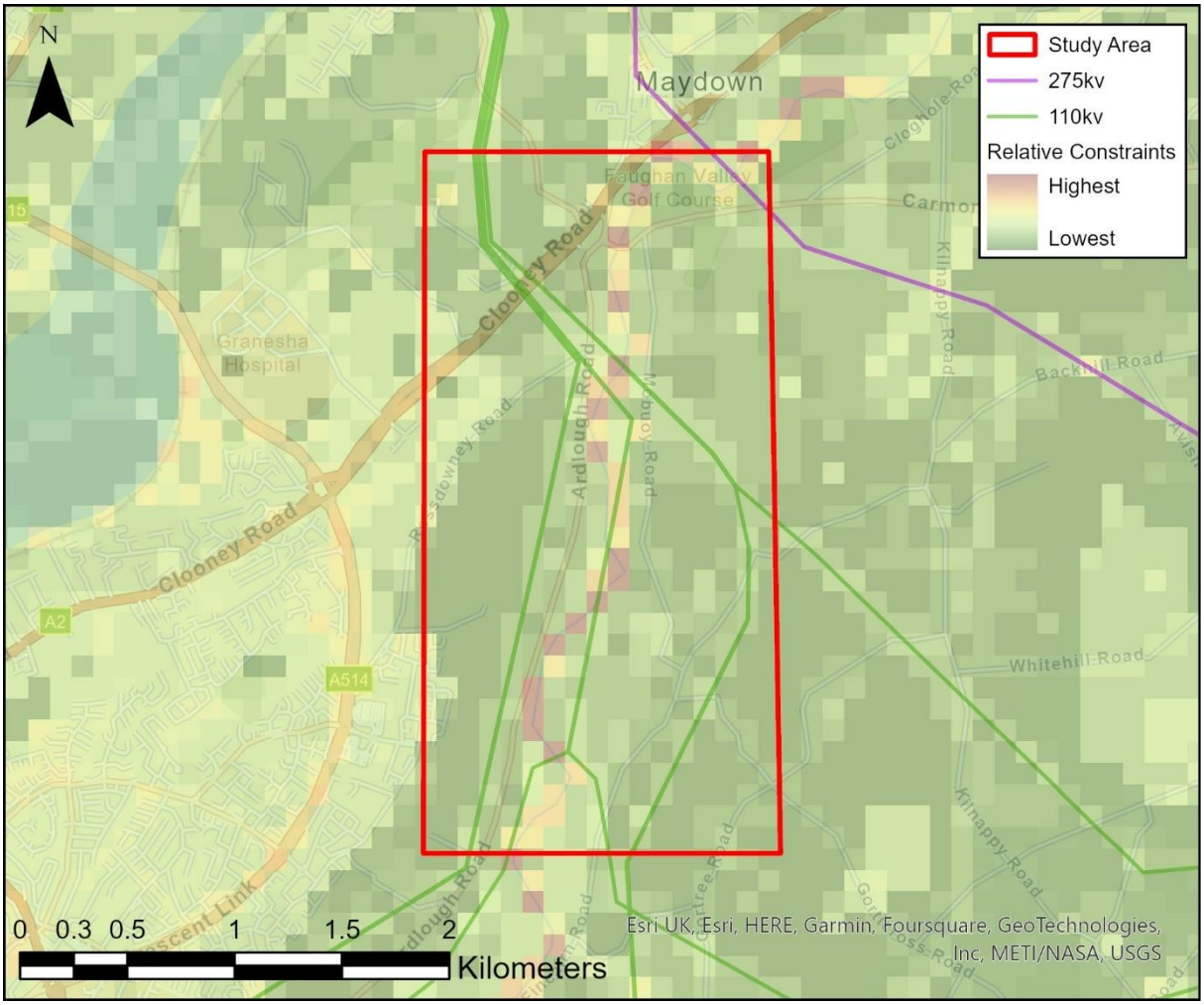
Cultural, Architectural & Archaeological Heritage – Within the study area there are 16 SMR sites (e.g., heavy anti-aircraft battery, burnt mound and associated spread, Bronze Age cremation) and three Scheduled Zones (Green Island Crannog and Tower House, Rough Island Crannog, and Enagh Church and Graveyard). The study area contains six Listed Buildings, three Industrial Heritage Areas (Flax holes and a bridge), three Defence Heritage Areas, and one Park and Garden (Enagh House).

Landscape & Visual Amenity – Within the study area there are three LCAs of medium / high sensitivity, namely Burnigibbagh and Drumahoe, Foyle Valley, and Lough Foyle Alluvial Plain.

Study Area



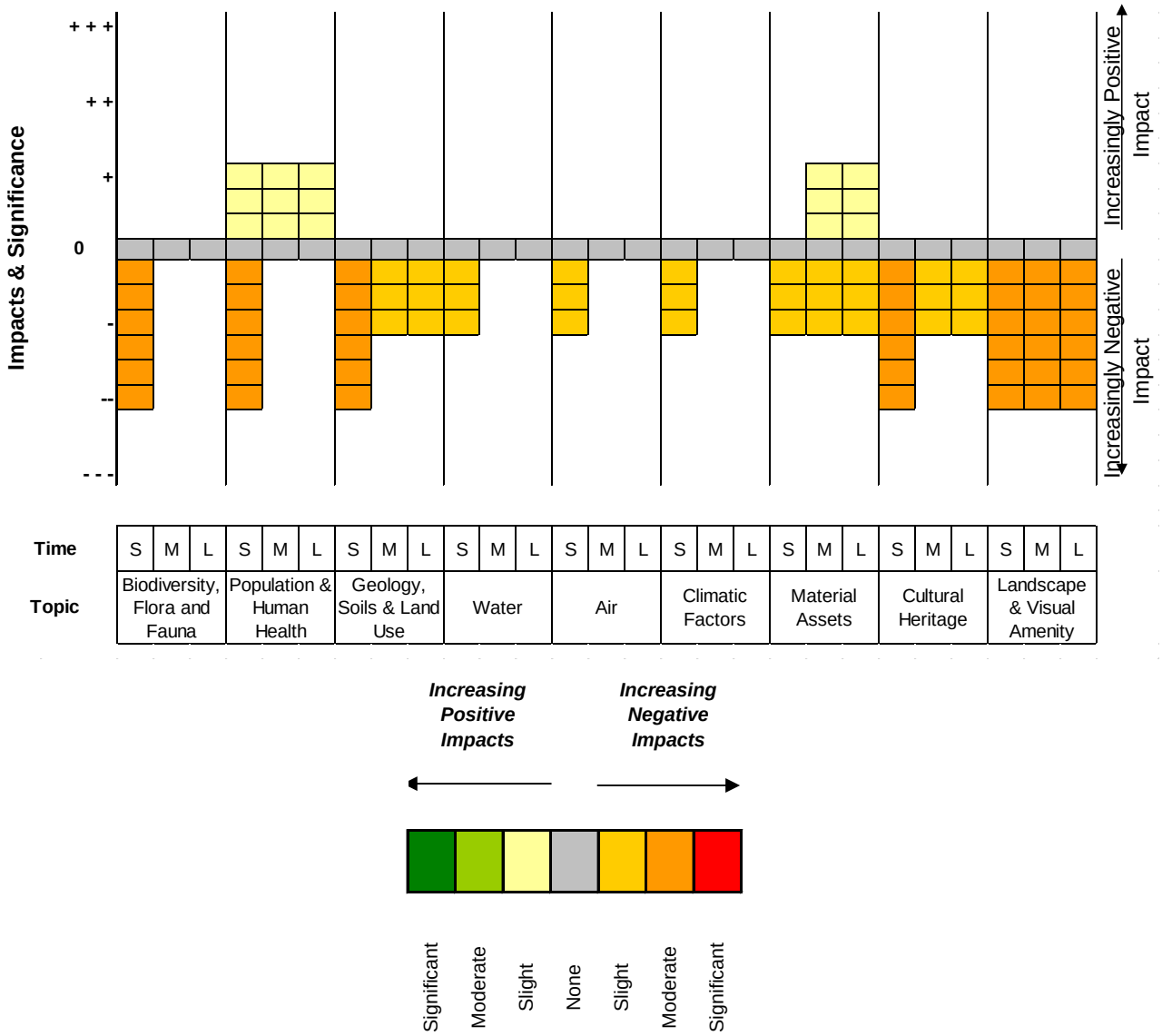
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-2 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	-2	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the new NW Switching Station has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, including in a higher population density settlement area in (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the station (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any significant impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight

negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight to moderate, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight potential for medium- or long-term impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.9 Coolkeeragh 110 kV Extension – Project 9

Coolkeeragh 110 kV Extension – Substation Extension

It is proposed to extend the existing 110 kV substation to the North (up to the road). The wider study area and 50% least cost area have been determined in GIS.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There are no habitat or biodiversity designations within the study area.

Population & Human Health - There are no main settlements, areas of lower perceived health, Neighbourhood Renewal Areas or peace lines within the study area. The mean population density of this study area is 0.21 people / km^2.

Geology, Soils & Land Use – The study area covers approximately 0.004km^2, and is comprised of broadleaf woodland (31%), arable land (7%), semi-natural grassland (5%), mountain, heath and bog (20%), and urban land (34%).

Water – There are no river segments, WFD water bodies or areas of flood risk identified within the study area.

Air – There are no AQMAs or other known air quality issues within the study area.

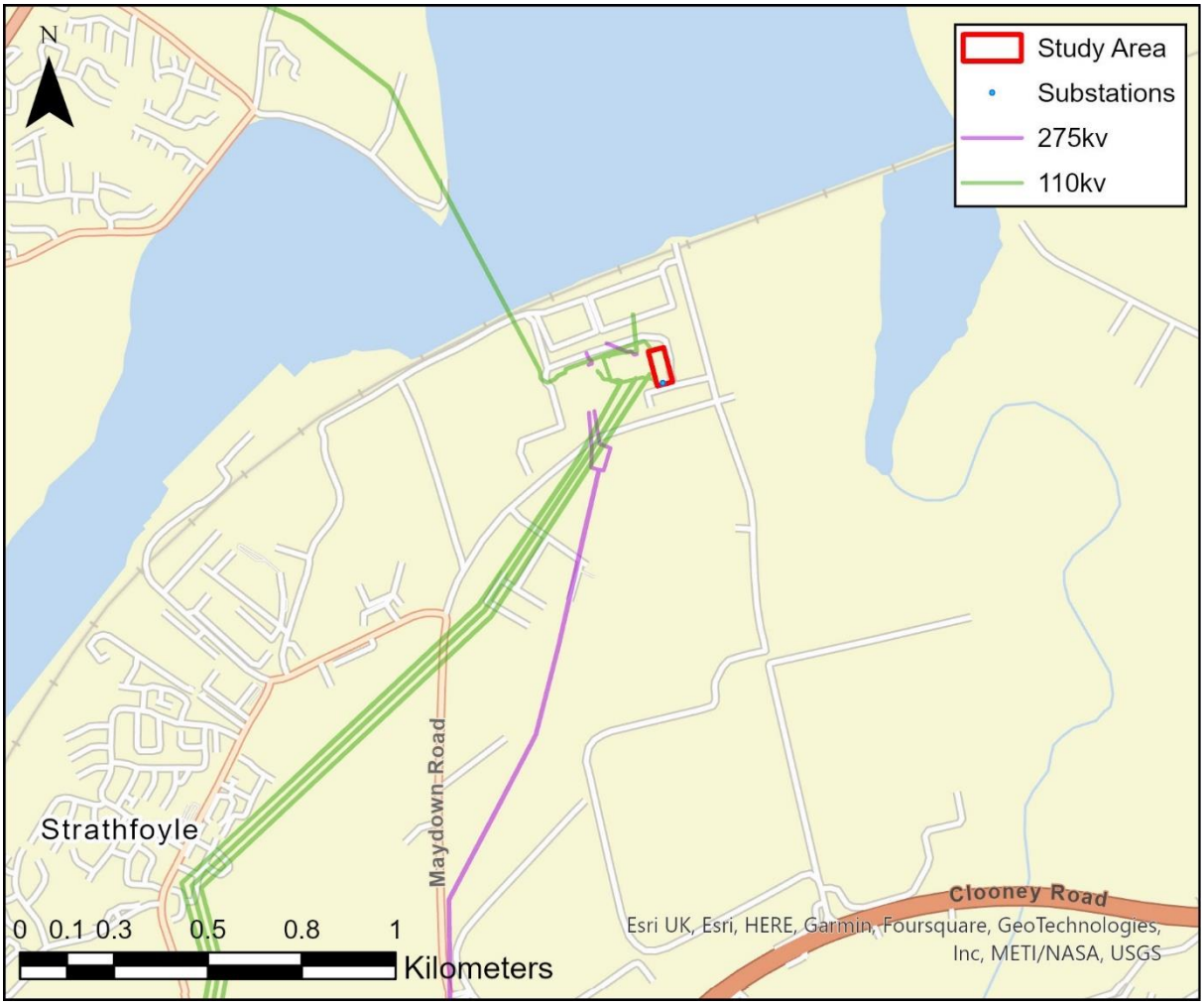
Climatic Factors – There are no areas of climate change flood risk identified within the study area.

Material Assets – There are electricity transmission lines within the study area, including nine 110 kV overhead lines and one 275 kV overhead line. No roads intersect the study area.

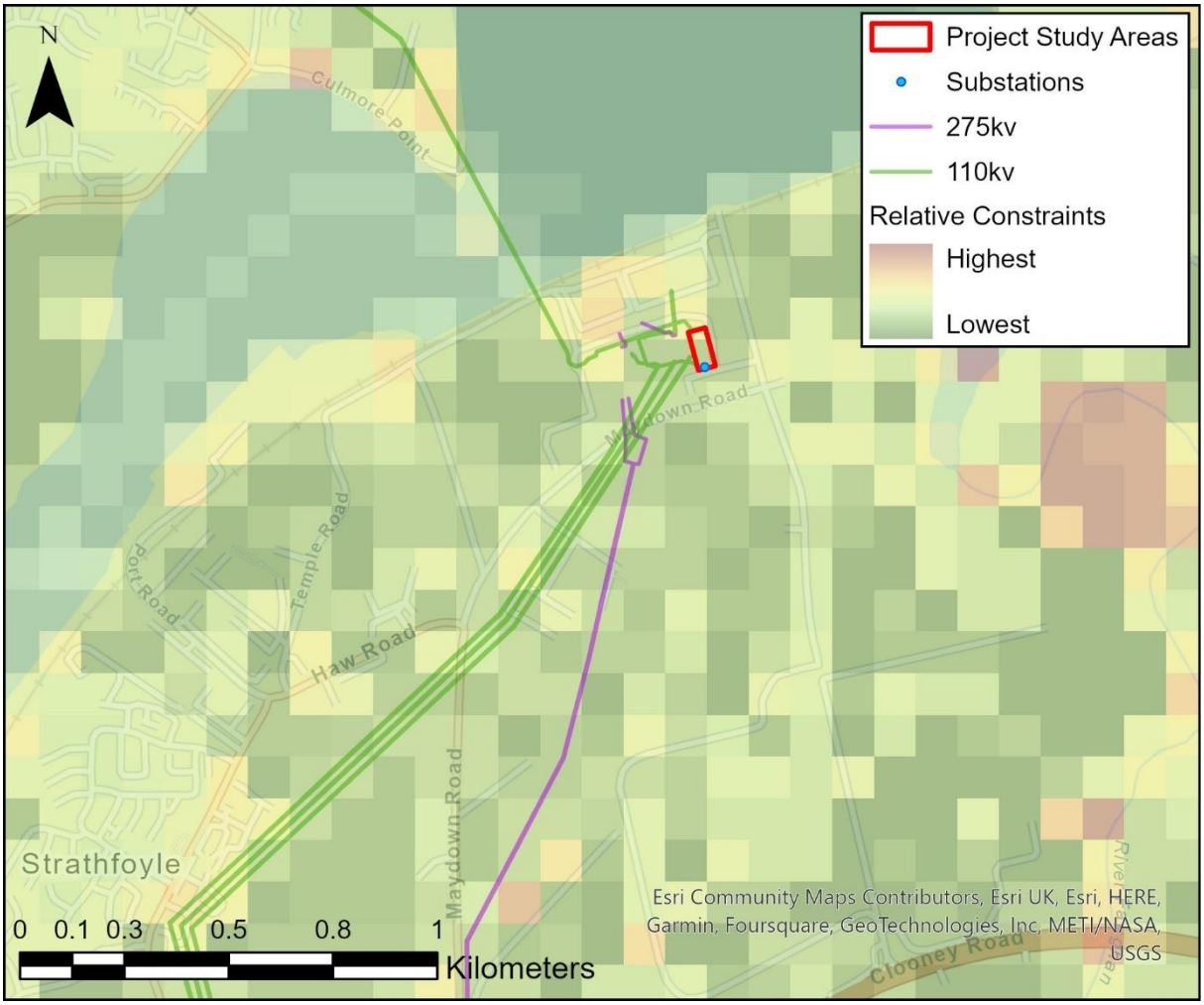
Cultural, Architectural & Archaeological Heritage – There are no known heritage features within the study area.

Landscape & Visual Amenity – The Lough Foyle Alluvial Plain LCA is located within the study area; this LCA is of Medium / High sensitivity to development.

Study Area


N
Study Area
Substations
275kv
110kv
Strathfoyle
Maydown Road
Clooney Road
0 0.1 0.3 0.5 0.8 1
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

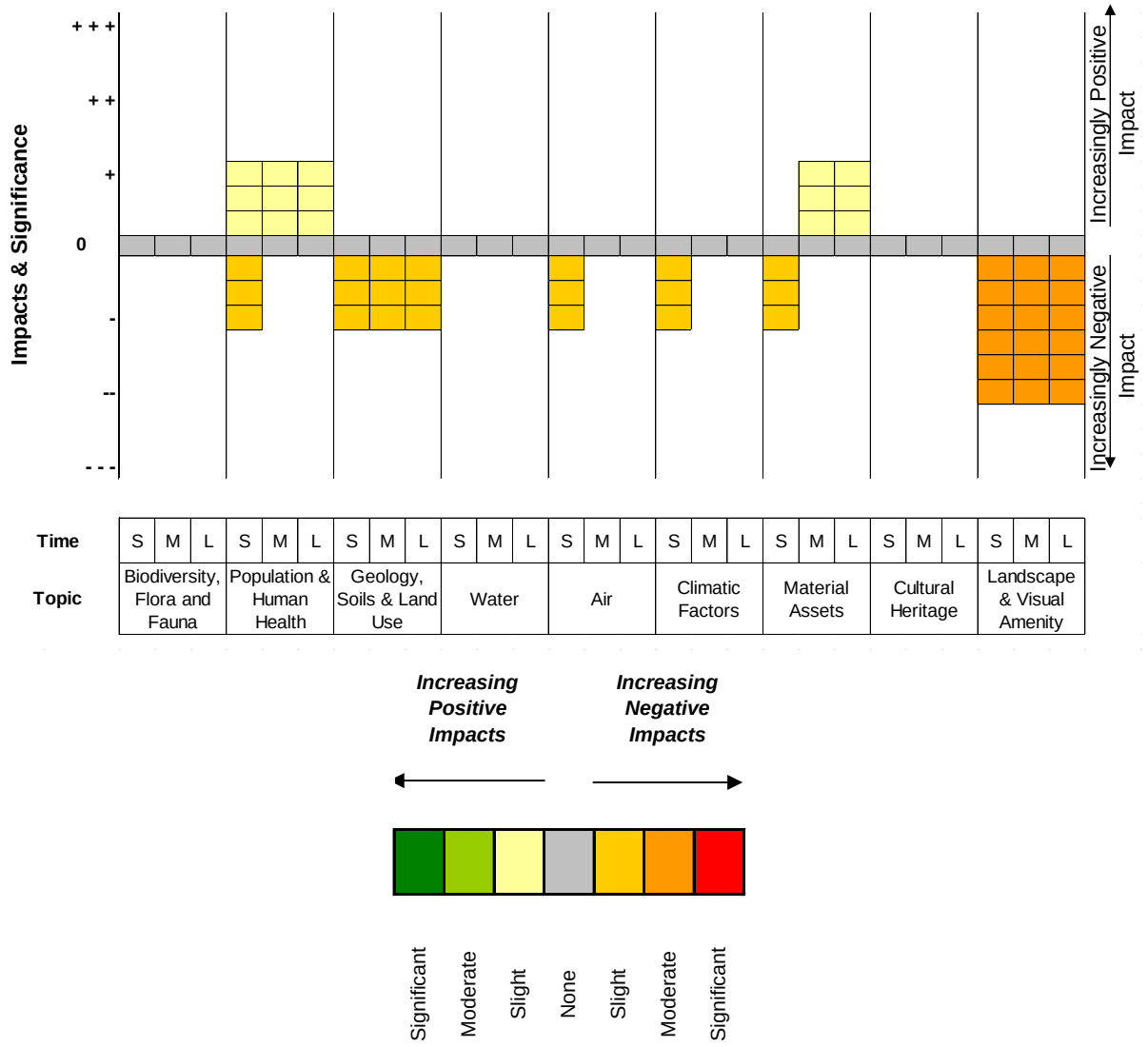
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	0	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-1	-1	-1
Water (W)	0	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	0	0	0
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Coolkeeragh 110 kV substation extension has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in a low-density population area (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the station (+1). There is the potential for short-, medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses (-1). There is unlikely to be any potential for short, medium-, or long-term impacts on Water status, resource or significant interaction with flood risk areas (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, slight negative

impacts on Material Assets owing to potential interactions with existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts on Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.2.10 Energising Belfast – Project 10

Energising Belfast – New Substation and Transmission Line

It is proposed to install new cables and substations in Belfast city centre, to commission transformer 4 at Castlereagh, and to remove in stages the Carnmoney - Castlereagh 110 kV overhead line. The study area has been determined in GIS, with areas of 50% lower constraint identified within this overall area.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there are two SPAs, namely Belfast Lough SPA and Belfast Lough Open Water SPA. Belfast Lough is also designated as a RAMSAR site and an RSPB Reserve. The study area contains four ASSIs, namely Bellevue, Belvoir, Inner Belfast Lough and Outer Belfast Lough. In total, there are 53 SLNCIs within the study area. There are three Salmonid Rivers within the study area, namely Ballymartin Water Upper, Forth River and Three Mile Water.

Population & Human Health – There are five main settlements within the study area, namely Belfast City, Greenisland, Metropolitan Castlereagh, Metropolitan Lisburn and Metropolitan Newtownabbey. The mean population density of this study area is 65.3 people / km^2. Within the study area there are 13 Neighbourhood Renewal Areas, namely Andersonstown, Crumlin Ardoyne, Falls Clonard, Greater Shankill, Inner East Belfast, Inner North Belfast, Inner South Belfast, Ligoniel, Outer West Belfast, Rathcoole, South West Belfast, Upper Ardoyne Ballysillan and Upper Springfield Whiterock. There are 16 peace lines within the study area, namely Alexandra Park, Alliance Avenue, Ardoyne Woodvale, Duncairn Gardens, Falls and Shankill, Henry Street, Longlands Road, Lower Oldpark Cliftonville, Mountainview Parade, Newington Street, Roden Street, Serpentine Gardens, Short Strand, Squires Hill, Torrens and Upper West Belfast. There are areas of lower perceived health throughout the study area, predominantly to the west of Belfast city centre and the docklands / harbours areas.

Geology, Soils & Land Use – The study area covers approximately 144km^2, which is composed of broadleaf woodland (6%), semi-natural grassland (4%), urban / suburban land (68%), coastal land (2%), mountain heath and bog (5%), and saltwater (3%). There are two ASSIs designated for geological features, namely Bellevue and Outer Belfast Lough. Within the study area there are 102 ancient woodland areas (30 of which have been lost), and one Forest Service site, which is located at Belvoir. There are five upland areas that have been identified, and four areas comprised of landslide deposits in the Belfast Hills. Within the study area 23 PPC sites (e.g., Hightown Industrial Estate, Ballyduff Landfill, Larsen Powder Plant) and 1089 historical sites that have the potential of being contaminated land have been identified (e.g., military installations, former docklands and dockyards, textile works and dye works, former railway lands). There is also an area of unstable peat ground located on the edge of the study area to the west.

Water – Within the study area there are nine WFD Rivers of these, one is of Good WFD ecological status (Collin Glen River), four are of Moderate ecological status (Ballymartin Water, Three Mile Water, Ballystockart River and Minnowburn), three are of Moderate ecological potential (Derriaghy River, River Lagan (Stranmillis) and Blackstaff (Belfast River)), and one is of Poor ecological potential (Connswater). There 139 river segments within the study area. The study area contains three WFD Transitional / Coastal

water bodies; of these, two are of Moderate ecological potential (Lagan Estuary and Belfast Harbour), and one is of Moderate ecological status (Belfast Inner Lough). There is one drinking water river located within the study area of the River Lagan. Within the study area there are 13 Shellfish Licence areas located at Jordanstown, Newtownabbey, Off Greenisland, South Middle Back, West of Oyster Bank, Whiteabbey and Whitehouse Roads. Within the study area there several significant areas of 1% AEP fluvial flood risk, including the Belfast Harbour, River Lagan, Newtownabbey, Knockbreda, Castlereagh and Newtownbreda areas. There are areas with significant areas of 0.5% AEP coastal flood risk located within the Belfast Harbour area, extending up the coastline towards Whiteabbey, and the River Lagan up to Belvoir Park Forest. There are areas with significant 0.5% AEP pluvial flood risk widespread across the study area, located throughout the Belfast area as well as extending up the coast to the Newtownabbey and Whiteabbey areas.

Air – Within the study area there are five AQMAs, namely Belfast AQMA No.1, Belfast AQMA No.2, Belfast AQMA No.3, Belfast AQMA No.4, and AQMA No.3 (Elmfield).

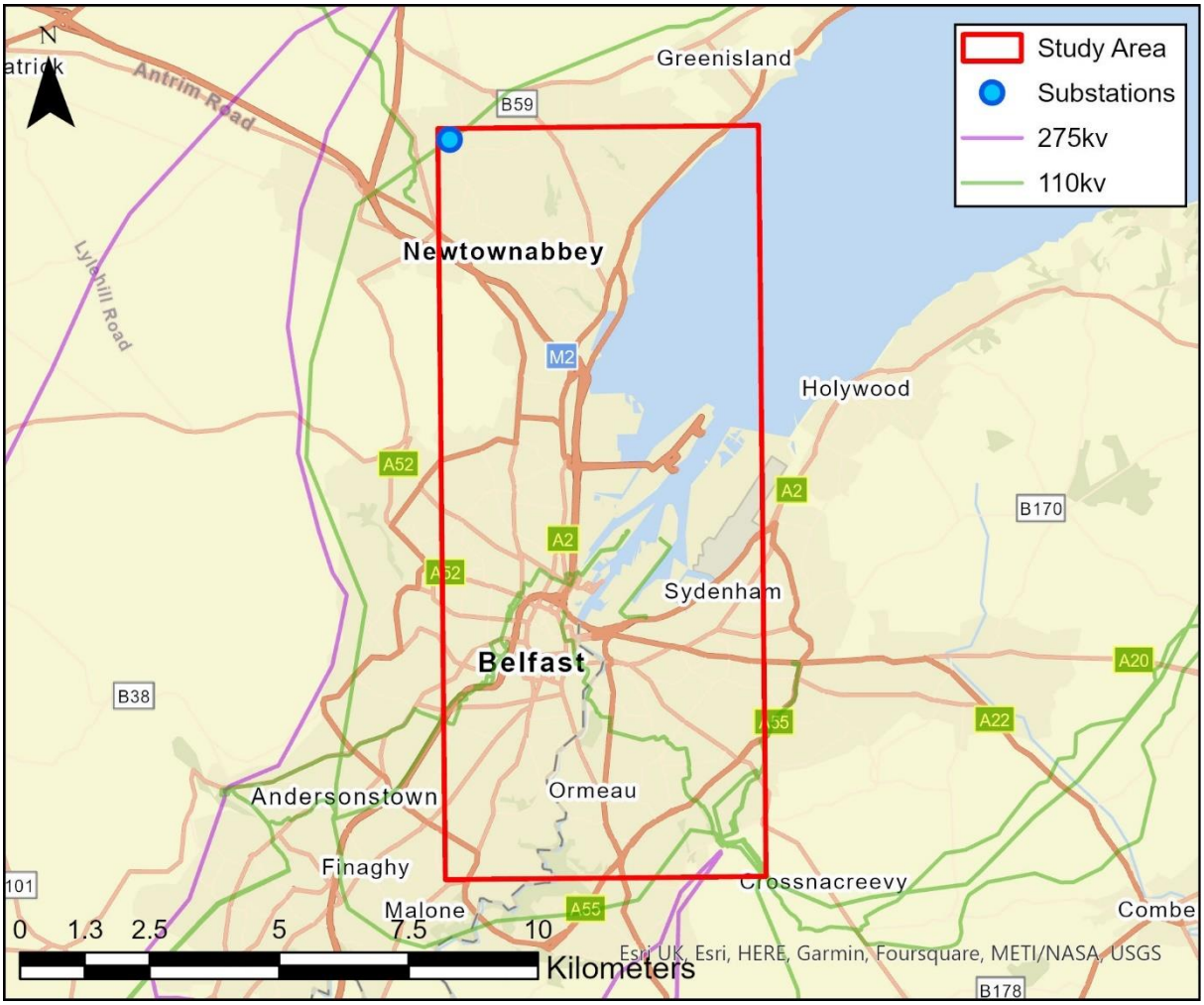
Climatic Factors – Within the study area there several significant areas of 1% AEP climate change fluvial flood risk including the Belfast Harbour, River Lagan, Newtownabbey, Knockbreda, Castlereagh and Newtownbreda areas. There are three significant areas of 0.5% AEP climate change coastal flood risk located at the Belfast Harbour area, extending up the coastline towards Whiteabbey, and the River Lagan between up to Belvoir Park Forest. There are areas with significant 0.5% AEP climate change pluvial flood risk widespread across the study area, located throughout the Belfast area as well as extending up the coast to the Newtownabbey and Whiteabbey areas.

Material Assets – Within the study area there are 17 km of motorway, 12 km of dual carriageway, 59 km of A roads, 33 km of B roads, 111 km of minor roads, and 2 km of <4M tarred roads. Approximately 39 km of railways crosses the study area. The Belfast City Airport land lies within the study area. Within the study area there are electricity transmission lines, including 264 110 kV OHLs and six 257 kV OHLs. Within the study area there is 5.23 km^2 of agricultural land; this is comprised of 0.88 km^2 of complex cultivation patterns, 0.03 km^2 of land principally occupied by agriculture and 4.36 km^2 of pastures.

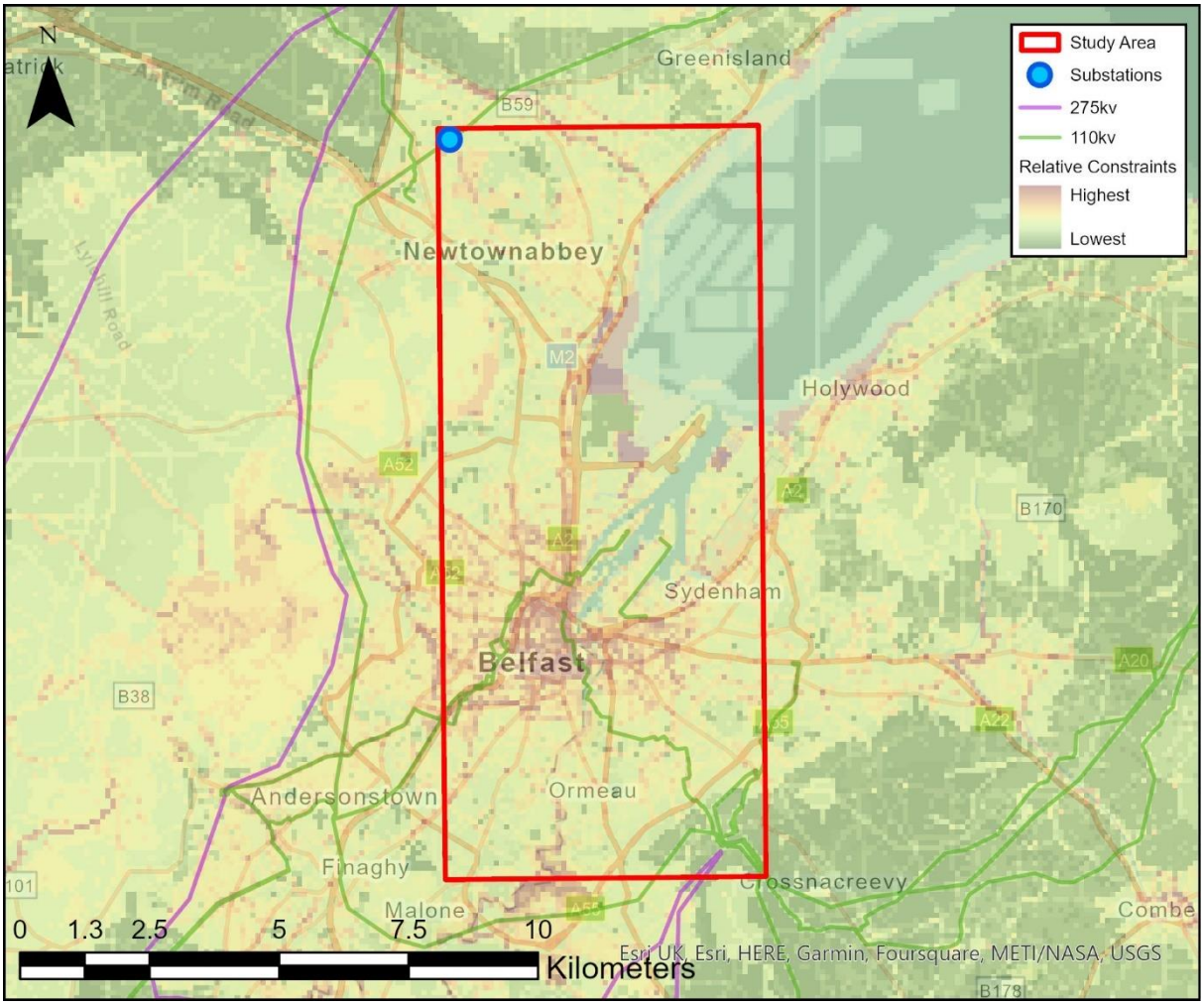
Cultural, Architectural & Archaeological Heritage – Within the study area there are 228 SMRs (e.g., raths, enclosures, medieval boundaries, findspots) and 39 Scheduled Zones. The study area contains 1698 Listed Buildings, 885 Industrial Heritage areas, 149 Defence Heritage Areas (e.g., Sydenham airfield, Ballygolan House, Lisnabreeny American Military Cemetery), and one Area of Archaeological Potential, located in central Belfast. Additionally, 22 Parks and Gardens are located within the study area. There is also an Area of Significant Archaeological Interest located to the south of the study area.

Landscape & Visual Amenity – Within the study area there are eight LCAs; of these, there are four of High sensitivity (Belfast Basalt Escarpment LCA, Castlereagh Slopes LCA, Divis Summits LCA and Lagan Parkland LCA), and four of Medium / High sensitivity (Belfast / Lisburn LCA, Carrickfergus Shoreline LCA, Castlereagh Plateau LCA, and Three and Six Mile Water Valleys LCA) to development. The study area also contains the Lagan Valley AONB and the Lagan Valley Regional Park (Country Park). Two National Trust Lands at Crown, and Divis and Black Mountain are located within the study area.

Study Area


Study Area
Substations
275kv
110kv
Greenisland
Newtownabbey
Holywood
Sydenham
Belfast
Andersonstown
Ormeau
Finaghy
Malone
Crossnacreevy
Combe
Antrim Road
Lylehill Road
B59
M2
A52
A2
B170
A20
A22
B38
A55
B178
101
0 1.3 2.5 5 7.5 10
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

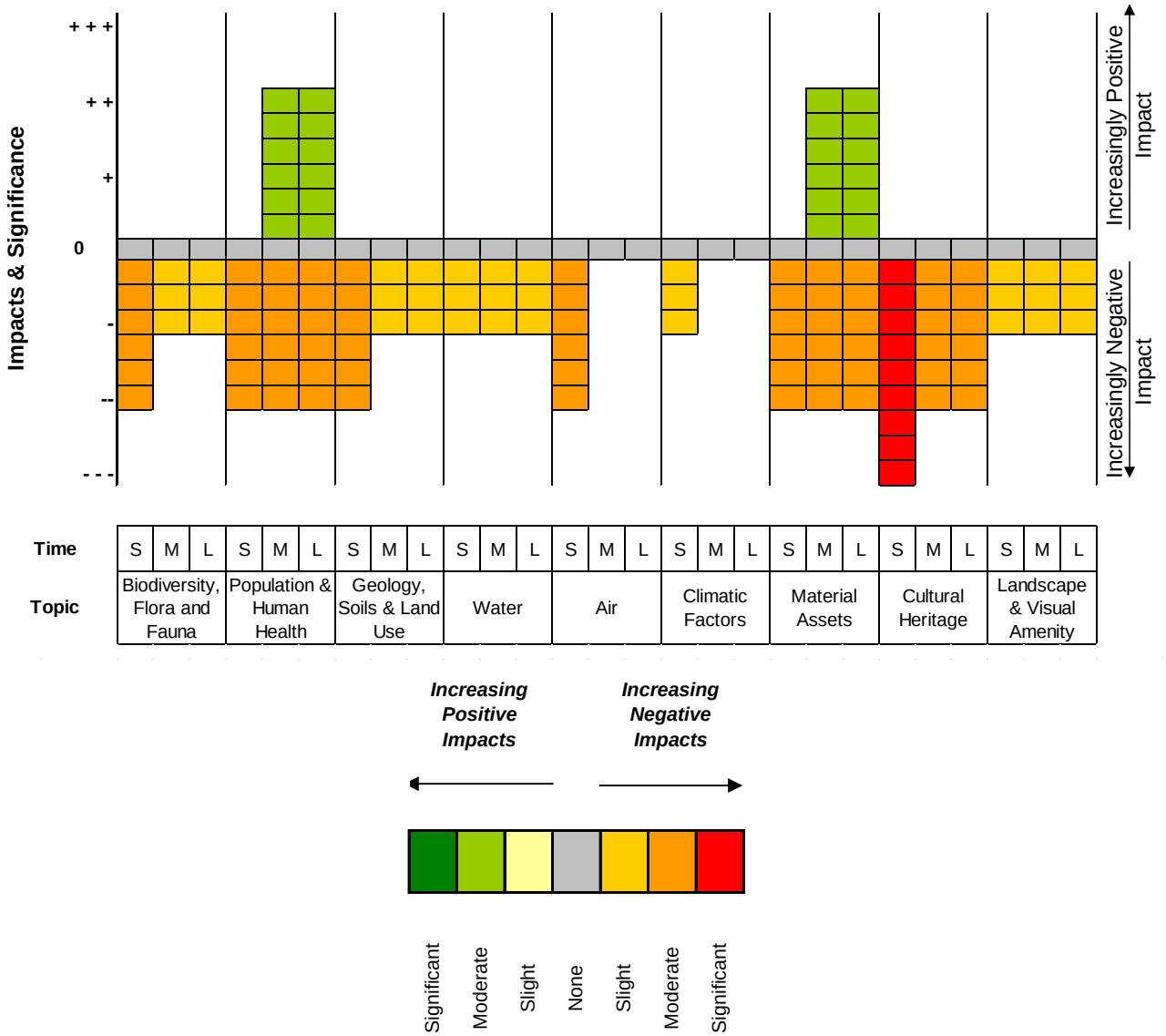
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	-1	-1
Population & Human Health (PHH)	-2	-2 / +2	-2 / +2
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	-1	-1
Air (A)	-2	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-2	-2 / +2	-2 / +2
Cultural, Architectural & Archaeological Heritage (CH)	-3	-2	-2
Landscape & Visual Amenity (L)	-1	-1	-1

Summary Chart of Potential Effects



Key Conclusions:

Development of new cables and substations in Belfast city centre has the potential for short-term, temporary, construction phase impacts on international, national, and local designated sites and Salmonid Rivers (-2), to long-term permanent, direct and indirect impacts on local designated sites (-1). There is the potential for short-term, temporary, construction phase, moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+2). There is the potential for short-term, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2) during the construction phase, and medium-, and long-term, slight permanent loss of soils and existing land use in a primarily urban area (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with numerous flood risk areas in the medium- to long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including in sensitive areas (-2); there are unlikely to

be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent moderate negative impacts on Material Assets owing to potential interactions with road, rail, agricultural land, and existing transmission infrastructure (-2); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to significant, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-3), and moderate potential for medium- or long-term impacts on these heritage features, or their setting, within the study area, following these works (-2). There is the potential for short-term, construction phase, to long-term permanent, negative impacts on Landscape and Visual Amenity, including within a medium to high sensitivity LCA, however impacts from new substations and underground cabling are expected to be slight owing to the existing urban setting (-1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.11 Eden – Carnmoney Reinforcement – Project 11

Eden – Carnmoney Reinforcement – Transmission Line Underground Cables and Restring / Uprate

It is proposed to remove the overhead line in Carnmoney and Carrickfergus and replace with new underground cable laid in roads; to refurbish the overhead line in the rural area between Carnmoney and Carrickfergus; and to install a 2nd 110/33 kV transformer at Glengormley Main substation. The overall study area has already been determined in GIS, as well as a 1% least cost corridor area, and an uprate area; for assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there are three ASSIs, namely Copeland Reservoir, North Woodburn Glen and South Woodburn. In total, there are ten SLNCIs within the study area, namely Brookmount Glen, Carnmoney Hill, Carnmoney Plug, Copeland Reservoir, Jointure Bay Stream, Knockagh – Dorisland, Oakfield, South Woodburn, Three Mile Water and Woodburn. There are two Salmonid Rivers that run through the study area, Three Mile Water, and Woodburn River.

Population & Human Health – There are four main settlements located within the study area, namely Carrickfergus, Greenisland, Metropolitan Newtownabbey and Trooperslane. The mean population density of this study area is 37.2 people / km^2. There are areas of lower perceived health located in Newtownabbey, Greenisland and Carrickfergus.

Geology, Soils & Land Use – The study area covers approximately 39 km^2, which is comprised of broadleaf woodland (9%), coniferous woodland (1%), arable land (21%), semi-natural grassland (3%), mountain, heath and bog (5%), and urban / suburban land (37%). Within the study area there are 15 ancient woodland areas near Carrickfegus, (five of which have been lost) and six Forest Services sites that are part of Woodburn Forest. There is one area of unstable ground comprising peat that has been identified, as well as two upland areas, and two areas comprised of landslide deposits. Within the study area, four PPC sites (Ryobi Aluminium Castings (UK) Ltd, Ballyduff Landfill Site, Dorisland WTW, and one unspecified business at 25 Old Carrick Road) and 123 historical landuse sites (e.g., mineral workings, former railway lands, which have the potential of being contaminated land, have been identified. Within the study area there are eight

abandoned mines. There are no quarries within the study area, however one is located off Fort Road c. 1.6 km to the north-east of the study area.

Water – Within the study area there are four WFD Rivers, of which two are of Moderate WFD status (Ballymartin River and Three Mile Water), and two are of Moderate ecological potential (Woodburn River and Copeland Water). There are 124 river segments within the study area. Within the study area there are two drinking water rivers, namely Copeland Water and Woodburn River. There are some regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Greenisland, Carrickfergus, Eden, Monkstown, Mossley, Woodburn and Copeland Reservoir areas. There are no 0.5% AEP coastal flood risk areas within the study area, however, there is one significant area of 0.5% AEP coastal flood risk along the coastline within c. 1 km of the south/east border of the study area. There are several areas with significant 0.5% AEP pluvial flood risk within the study area, including the Mossley, Cammoney, Monkstown, Greenisland, Woodburn and Carrickfergus areas.

Air – There are no AQMAs or other known air quality issues within the study area.

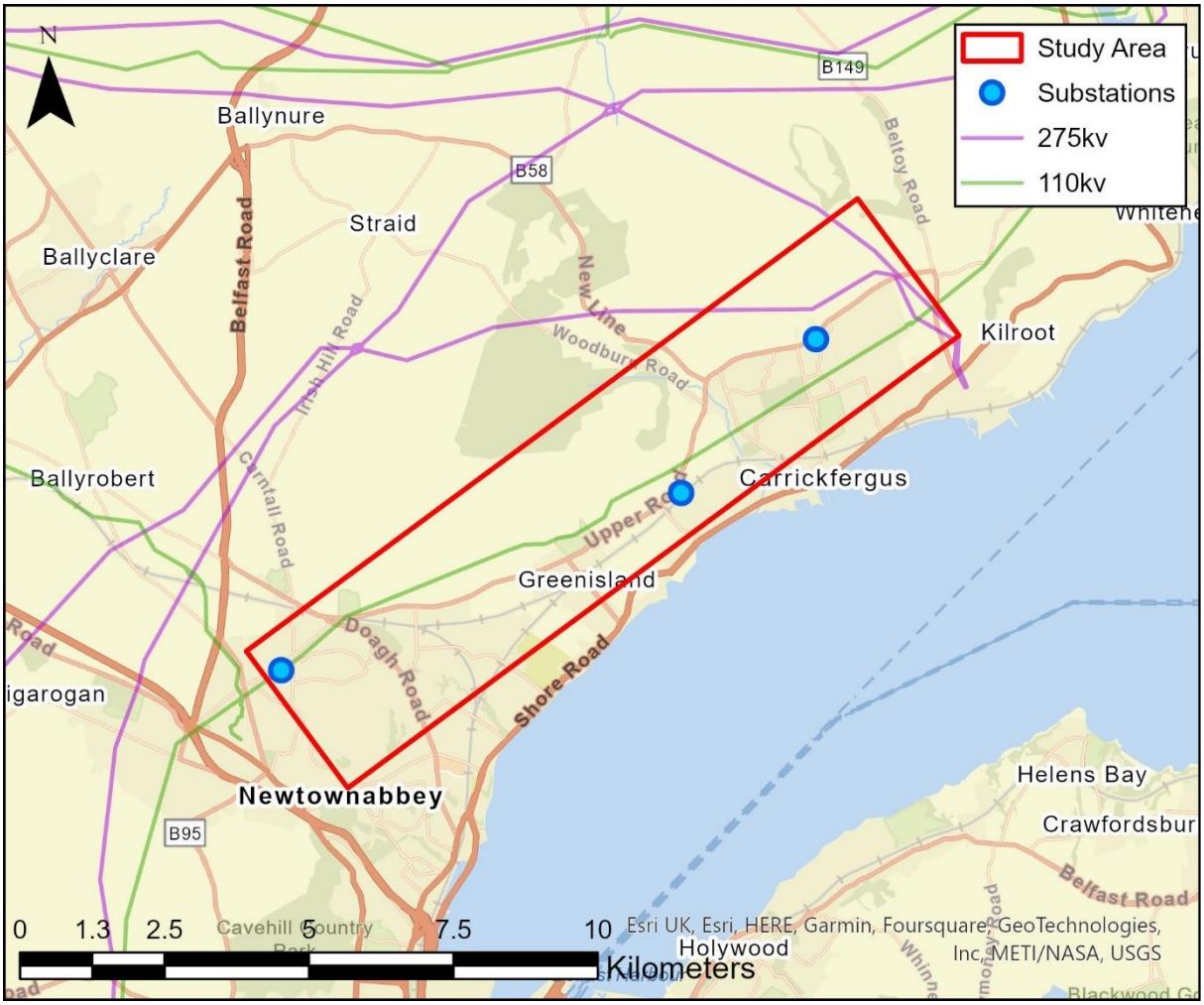
Climatic Factors – There are some regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Carrickfergus, Eden, Greenisland, Monkstown, Mossley, Woodburn and Copeland Reservoir areas. There are no 0.5% AEP climate change coastal flood risk areas within the study area, however, there is one significant area of 0.5% AEP climate change coastal flood risk along the coastline within c. 1 km of the south / east border of the study area. This area is within 50 m of the study area around the Trooperslane Industrial Estate in Carrickfergus. There are several areas with significant 0.5% AEP climate change pluvial flood risk within the study area, including the Mossley, Carnmoney, Monkstown, Greenisland, Woodburn and Carrickfergus areas.

Material Assets – Within the study area there are 22 km of B roads, 2 km of <4M tarred roads and 35 km of minor roads. Approximately 15 km of railway line crosses through the study area. The NW Pipeline and PNG Transmission gas line run through the study area, as well as nine electricity transmission lines, of which five are 110 kV OHLs and four are 275 kV OHLs. Within the study area there is 22 km^2 of agricultural land; this is comprised of 1.16 km^2 of land principally occupied by agriculture and 21 km^2 of pastures.

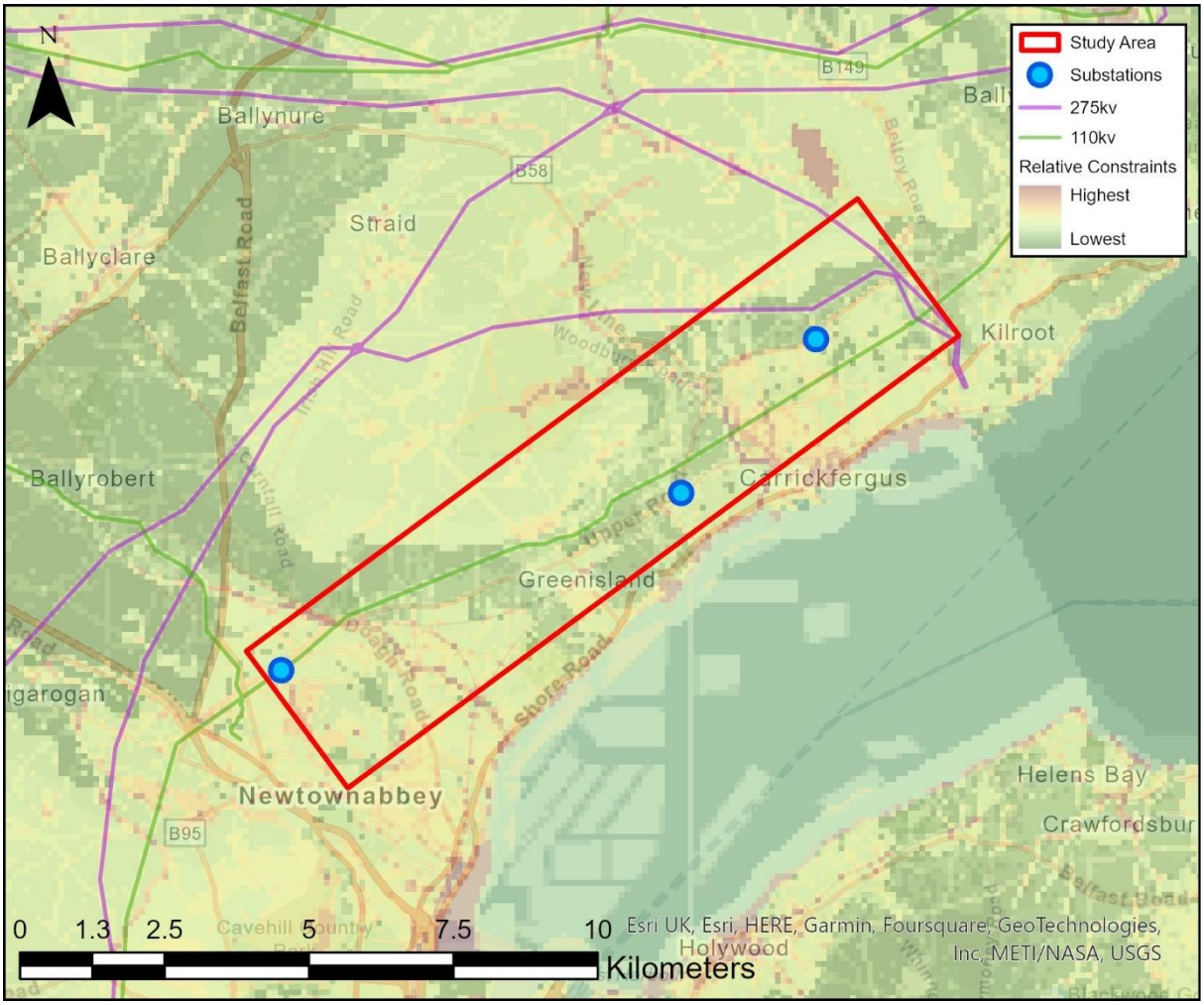
Cultural, Architectural & Archaeological Heritage – Within the study area there are 113 SMRs (e.g., Spring wells, enclosures, rath, earthworks) and 11 Scheduled Zones (e.g., raths, ring barrows). The study area contains 51 Listed Buildings, 164 Industrial Heritage areas (e.g., clay pit sites, salt mine sites, cotton mills, lime kilns) and eight Defence Heritage areas (e.g., Sullatober Mill, Prospect House).

Landscape & Visual Amenity – Within the study area there are four LCAS, of which one is of High sensitivity (Carrickfergus Farmed Escarpment LCA), and three are of Medium / High sensitivity (Carrickfergus Shoreline LCA, Carrickfergus Upland Pastures LCA, and Three and Six Mile Water Valleys LCA) to development.

Study Area


N
Study Area
Substations
275kv
110kv
Ballynure
B58
B149
Straid
Ballyclare
Belfast Road
Irish Hill Road
New Line
Woodburn Road
Beltoy Road
Kilroot
Ballyrobert
Carrickfergus
Upper Road
Carntall Road
Greenisland
Doagh Road
Shore Road
Newtownabbey
B95
Helens Bay
Crawfordsbur
Belfast Road
Holywood
0 1.3 2.5 5 7.5 10
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

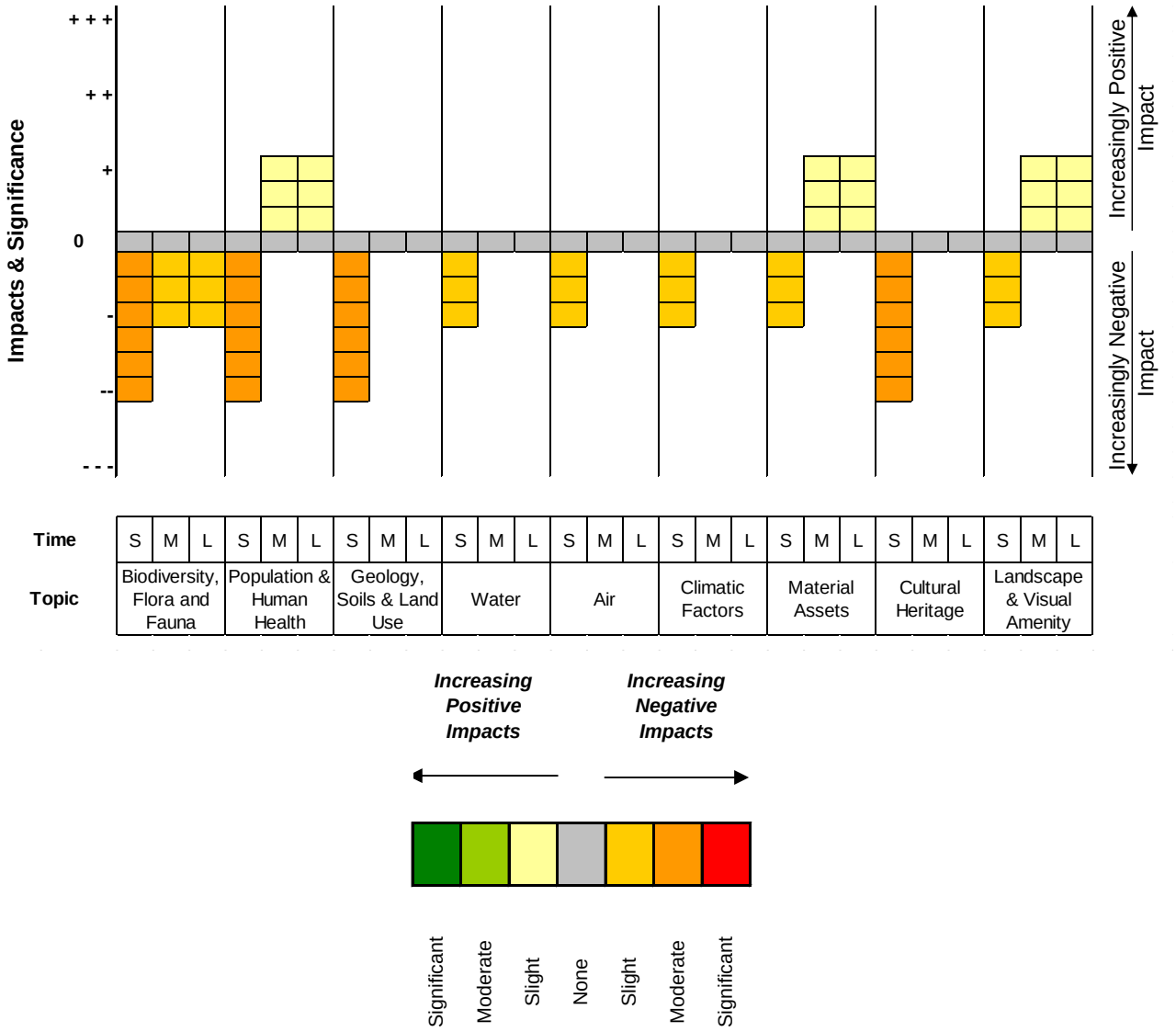
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	-1	-1
Population & Human Health (PHH)	-2	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-2	0	0
Landscape & Visual Amenity (L)	-1	+1	+1

Summary Chart of Potential Effects



Key Conclusions:

Development of the Eden – Carnmoney Reinforcement, comprising the undergrounding of cables in Carnmoney and Carrickfergus and the uprating of OHL in the rural area between these settlement aeras, has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including indirect impacts to international and national designated sites, and for short- to long-term, direct or indirect impacts on local designated sites and Salmonid Rivers (-1). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including direct soil loss, and potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight

negative impacts on Air during the restring, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the restring from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting. The undergrounding of the line through Carnmoney and Carrickfergus has the potential for positive impacts on the landscape and visual amenity of these areas in the medium- to long-term (+1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.12 Coolkeeragh – Killymallaght – Strabane 110 kV Uprating – Project 12

Coolkeeragh - Killymallaght - Strabane 110 kV Uprating – Transmission Line Restring / Uprate

It is proposed to uprate all existing overhead lines between Coolkeeragh, Killymallaght, and Strabane. The wider study area and uprate corridor have been determined in GIS. For assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there are two SACs, namely Binevenagh, and River Faughan and Tributaries. Lough Foyle is designated as a SPA and a RAMSAR site, this is the only instances of these designations within the study area. Within the study area there are three ASSIs, namely Lough Foyle, McKean's Moss, and River Faughan and Tributaries. There are four Salmonid Rivers within the study area, namely Burn Dennet Lower, Burngibbagh, Glenmornan River and River Faughan.

Population & Human Health - There are eight main settlements within the study area, namely Artigarvan, Ballymagorry, Culmore, Derry City, Donagheady, Maydown, New Buildings and Strathfoyle. The study area has a mean population density of 26.7 people / km^2. Within the study area there are two Neighbourhood Renewal Areas, namely Triax – Cityside, and Waterside, areas of lower perceived health within Derry / Londonderry, and two peacelines located at Dungiven Road and Lower Tullynally.

Geology, Soils & Land Use – The study area covers c. 78 km^2 and is composed of broadleaf woodland (8%), arable land (6%), improved grassland (37%), semi-natural grassland (21%), mountain, heath and bog (4%), coastal land (1%), urban / suburban land (17%) and saltwater (3%). There are 82 ancient woodland areas scattered throughout the study area. Within the study area, two areas of unstable ground have been identified around Strabane, as well as four upland areas. Within the study area nine PPC sites and 258

historical land use sites that have the potential of being contaminated land have been identified. There are two quarries within the study area, located off the Donagheady Road to the north-west of Dunnaghmanagh.

Water – Within the study area there are five WFD Rivers, of which one is of Good ecological status (Burngibbagh), and four are of Moderate ecological status (Sandville Burn, Burn Dennet River, Glenmornan River and Faughan River (Carnmoney), as well as 97 river segments. There are two transitional / coastal waterbodies within the study area, of which one is of Moderate ecological status (Upper Foyle), and one is of Moderate ecological potential (Foyle Harbour and Faughan). Within the study area there are two drinking water rivers, namely Burngibbagh and River Faughan. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the River Foyle, Londonderry, New Buildings, Ballymagorry, Artigarvin, Cloghcor, Milltown Burndennet and Tullyally areas. Within the study area there are significant areas of 0.5% AEP coastal flood risk located along the River Foyle, along the River Faughan from Faughan Valley Golf Course to the mouth of the river where it flows into Lough Foyle, as well as a water body located between the River Faughan and Mobuoy Road. There are areas with significant 0.5% AEP pluvial flood risk widespread throughout the study area within the Derry / Londonderry, Ballymagorry, Artigarvin, Drumahoe, Milltown Burndennet and Cloghcor areas.

Air – There are no AQMAs or other known significant air quality issues within the study area.

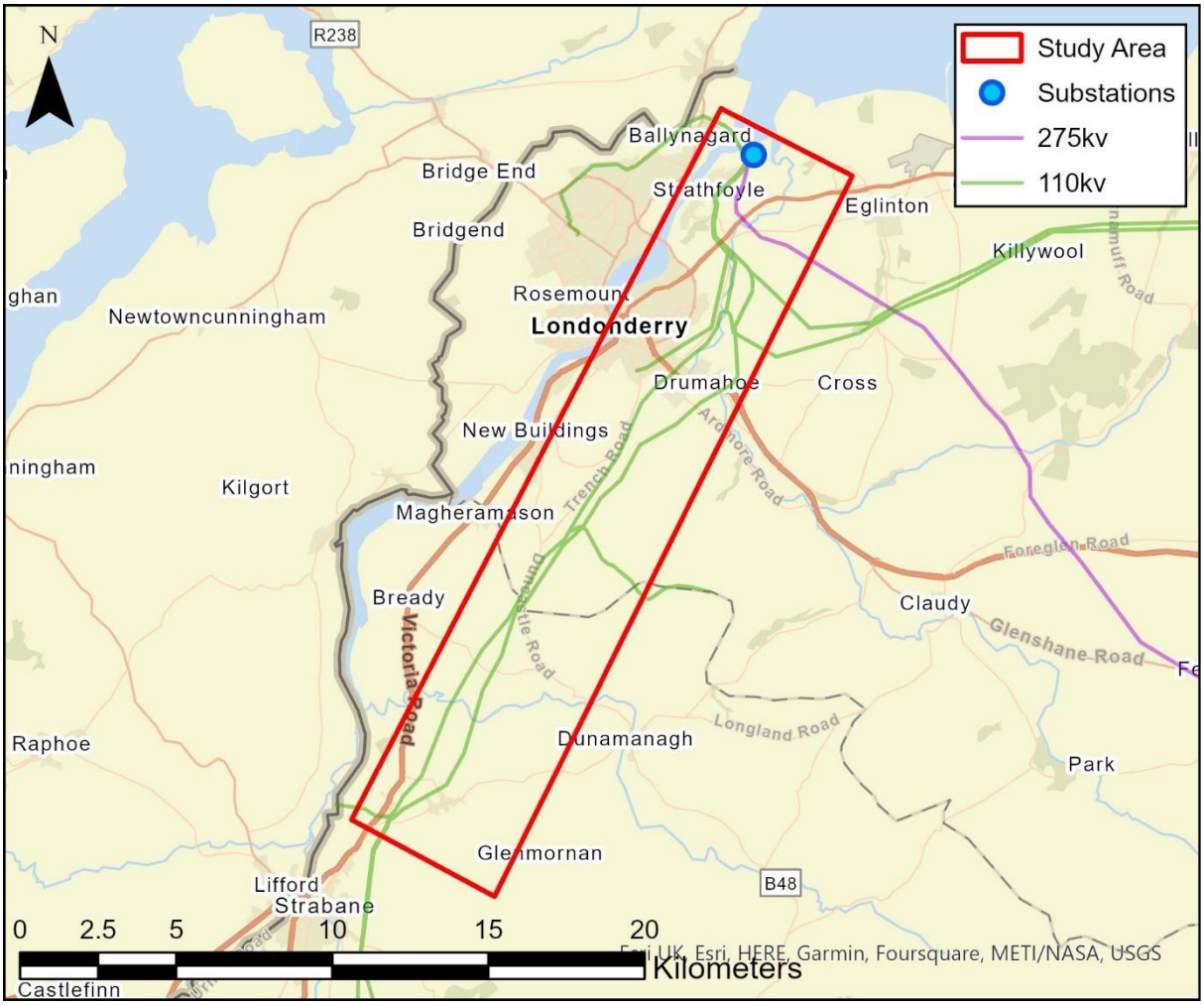
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the River Foyle, Londonderry, New Buildings, Ballymagorry, Artigarvin, Cloghcor, Milltown Burndennet and Tullyally areas. Within the study area there are significant areas of 0.5% AEP climate change coastal flood risk located along the River Foyle, along the River Faughan from Faughan Valley Golf Course to the mouth of the river where it flows into Lough Foyle, as well as a water body located between the River Faughan and Mobuoy Road. There are areas with significant 0.5% AEP climate change pluvial flood risk widespread throughout the study area within the Derry / Londonderry, Ballymagorry, Artigarvin, Drumahoe, Milltown Burndennet and Cloghcor areas.

Material Assets – Within the study area there are 6 km of dual carriageway, 18 km of A roads, 16 km of B roads, 73 km of minor roads, and 55 km <4M tarred roads. There is approximately 10 km of railway that crosses the study area. Within the study area there is one gas transmission line (NW Pipeline), and 22 electricity transmission lines, including twenty 110 kV OHLs and two 275 Kv OHLs. Within the study area there is 57.4 km^2 of agricultural land, comprised of 3.34 km^2 of non-irrigated arable land, 0.6 km^2 of complex cultivation patterns, 3.4 km^2 of land principally occupied by agriculture and 50 km^2 of pastures.

Cultural, Architectural & Archaeological Heritage – Within the study area there are 107 SMRs and 11 Scheduled Zones. There are 219 Listed Buildings, 224 Industrial Heritage areas and 101 Defence Heritage areas within the study area. The study area contains one Area of Archaeological Potential located near Derry / Londonderry, and six Parks and Gardens (Ashbrook, Boom Hall, Brook Hall, Thornhill, St Columbs and Holy Hill/ Holly Hill House).

Landscape & Visual Amenity – Within the study area there are four LCAs. The Sperrin Foothills LCA is of High sensitivity, the Foyle Valley LCA and Burngibbagh and Drumahoe LCA are of High / Medium sensitivity, and the Loughermore Hills LCA is of Medium / Low sensitivity to development. The Sperrin AONB is located within the study area.

Study Area


N
R238
Study Area
Substations
275kv
110kv
Ballynagard
Bridge End
Strathfoyle
Eglinton
Bridgend
Killywool
Rosemount
Newtowncunningham
Londonderry
Drumahoe
Cross
New Buildings
Kilgort
Magheramason
Trench Road
Ardmore Road
Foreglen Road
Bready
Claudy
Glenshane Road
Victoria Road
Longland Road
Raphoe
Dunamanagh
Park
Glenmornan
B48
Lifford
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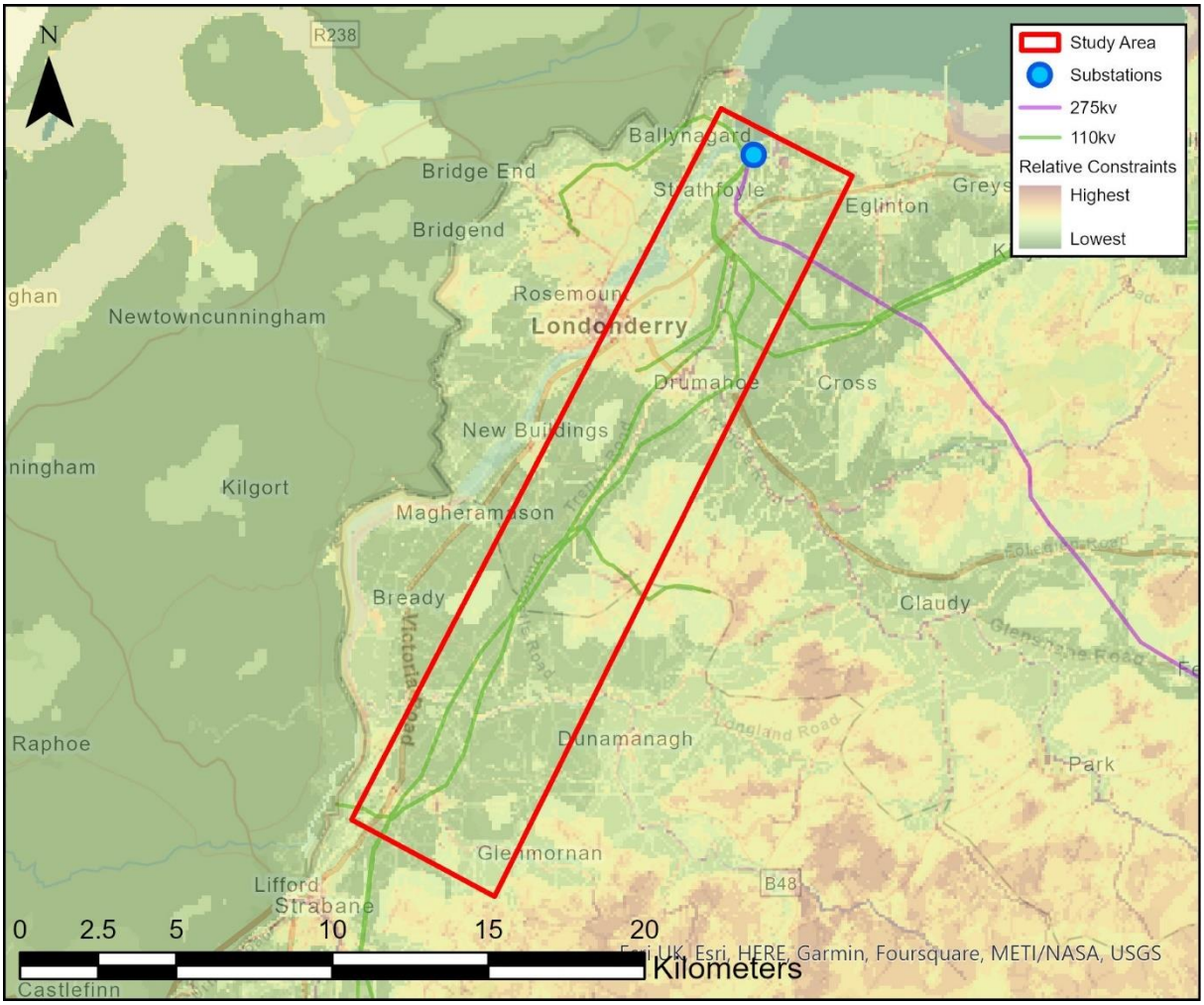
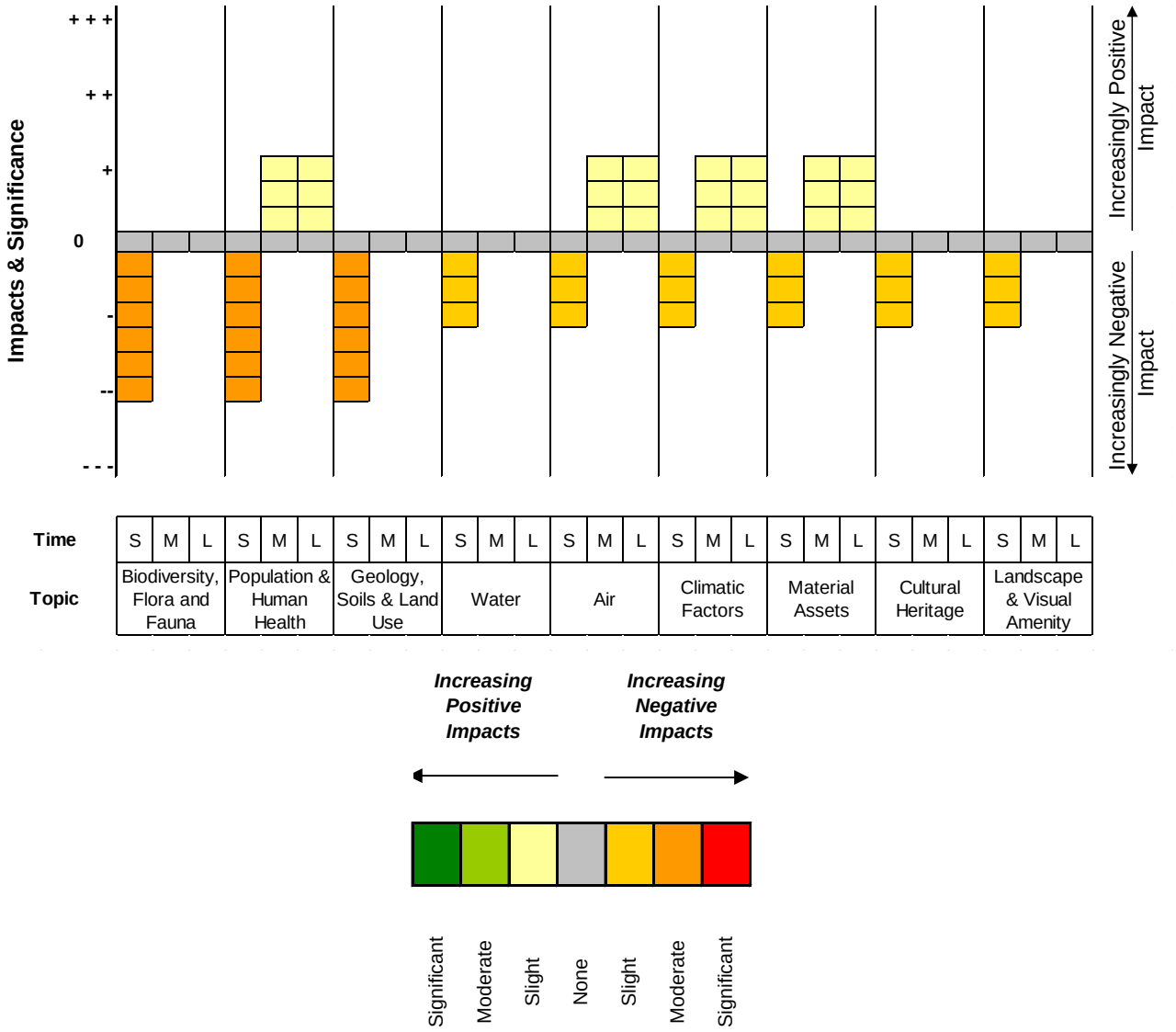
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-2	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-1	0	0
Landscape & Visual Amenity (L)	-1	0	0

Summary Chart of Potential Effects



Key Conclusions:

Development of the restring of existing 110 kV overhead lines between Coolkeeragh, Killymallaght, and Strabane has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national and local designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during

the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within an AONB and sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration, and disturbance and displacement impacts, on four European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.13 Omagh – Strabane 110 kV Uprating – Project 13

Omagh - Strabane 110 kV Uprating – Transmission Line Restring / Uprate

It is proposed to uprate both existing overhead lines between Omagh and Strabane. The wider study area and uprate corridor have been determined in GIS. For assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There are four SACs within the study area, namely Owenkillew River, River Finn, River Foyle and Tributaries, and Tully Bog. The study area crosses six ASSIs, namely Baronscourt, Grange Wood, Owenkillew River, River Foyle and Tributaries, Strabane Glen and Tully Bog. Within the study area there are 13 Salmonid Rivers / tributaries, namely Camowen River, Cappagh Burn, Douglas Burn Foyle, Drumragh River, Fairy Water, Glenmornan River, Glenscollip Burn, Lough Catherine Stream, Mourne River, Owenkillew River, River Derg, River Finn and Strule River.

Population & Human Health - There are 13 main settlements within the study area, namely Ardstraw, Artigarvan, Ballymagorry, Douglas Bridge, Gillygooly, Glebe, Knockmoyle, Mountjoy, Newtownstewart, Omagh Town, Sion Mills, Strabane and Victoria Bridge. The study area has a mean population density of 18.5 people / km^2. The study area encompasses two Neighbourhood Renewal Areas, namely Omagh and Strabane, and there are areas of lower perceived health around Omagh and Strabane. There are no peace lines within the study area.

Geology, Soils & Land Use – The study area covers 279.7 km^2 and is composed of broadleaf woodland (7%), coniferous woodland (3%), improved grassland, (46%), mountain heath and bog (11%), semi-natural grassland (19%), arable land (3%) and urban / suburban land (10%). Within the study area there are 155 ancient woodland areas, as well as three Forest Service sites (Baronscourt, Gortin Glen and Ligfordrum). There are 15 areas of unstable ground identified within the study area, and seven upland areas. Within the

study area there are nine PPC sites and 435 historical sites that have the potential of being contaminated land. There is one abandoned mine located within the study area.

Water – Within the study area there are 18 WFD rivers; of these, four are of Good ecological status (Douglas Burn (Foyle), Glenknock Burn, Lough Catherine Stream and Owenkillew River (Killymore)), one is of Moderate ecological potential (Mourne River), and 13 are of Moderate ecological status (Glenelly River, Cappagh Burn, Glenscollip Burn, Fairywater River (Dunwish), Creevan Burn, Drumragh River, Ballynahatty (Drumragh) Water, Glenmornan River, Cavanalee River, Derg River (Millbrook), Finn River, Camowen River (Omagh) and Strule River). There are 562 river segments contained within the study area. Within the study area there is one WFD Transitional waterbody (Upper Foyle), which is of Moderate ecological status. The study area contains five drinking water rivers, namely Camowen River, Cavanlee River, Glencollip Burn, Mourne River and River Derg. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Strabane, Omagh, Newtownstewart and Sion Mills areas. There are areas with significant 0.5% AEP pluvial flood risk widespread across the study area, including the Strabane, Omagh, Newtownstewart and Sion Mills areas.

Air – There are no AQMAs or other known air quality issues within the study area.

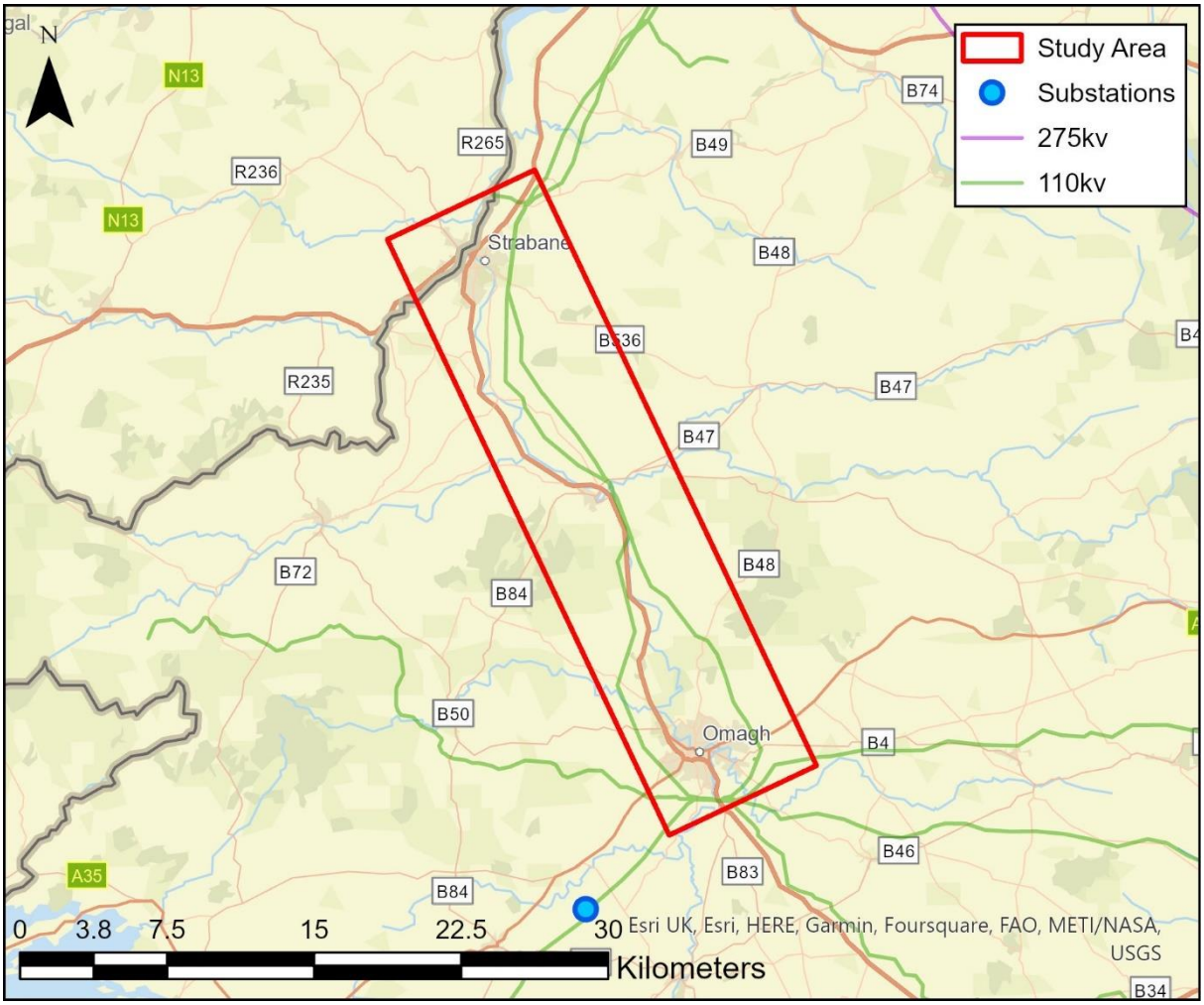
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Strabane, Omagh, Newtownstewart and Sion Mills areas. There are areas with significant 0.5% AEP climate change pluvial flood risk widespread across the study area, including the Strabane, Omagh, Newtownstewart and Sion Mills areas.

Material Assets – Within the study area there are 50 km of A roads, 83 km of B roads, 252 km of <4M tarred roads, and 156 km of minor roads. Within the study area there are 22 110 kV overhead electrical transmission lines. Within the study area there is 215 km^2 of agricultural land, comprised of 9.3 km^2 of non-irrigated arable land, 2.12 km^2 of complex cultivation patterns, 7.7 km^2 of land principally occupied by agriculture, and 196 km^2 of pastures.

Cultural, Architectural & Archaeological Heritage – Within the study area there are 221 SMR sites and 31 Scheduled Zones. The study area contains 382 Listed Buildings, 512 Industrial Heritage areas and 43 Defence Heritage areas. There are six Parks and Gardens that are contained within, or intersect, the study area, namely Barons Court, Lisnamallard, Creevenagh, Edenfel, Holy Hill / Holly Hill House and Moyle House.

Landscape & Visual Amenity – There are six LCAs within the study area, of which two are of High sensitivity (Bessy Bell and Gortin LCA, and Sperrin Mountains LCA) and four are of Medium / High sensitivity (Camowen Valley LCA, Derg Valley LCA, Foyle Valley LCA and Omagh Farmland LCA) to development. One National Trust Land is contained within the study area, namely Grays Printing Press. The Sperrin AONB is the only AONB that is intersected by the study area.

Study Area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Study Area
Substations
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110kv
N13
R265
R236
B74
B49
B48
Strabane
B536
R235
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B72
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B46
B83
A35
B84
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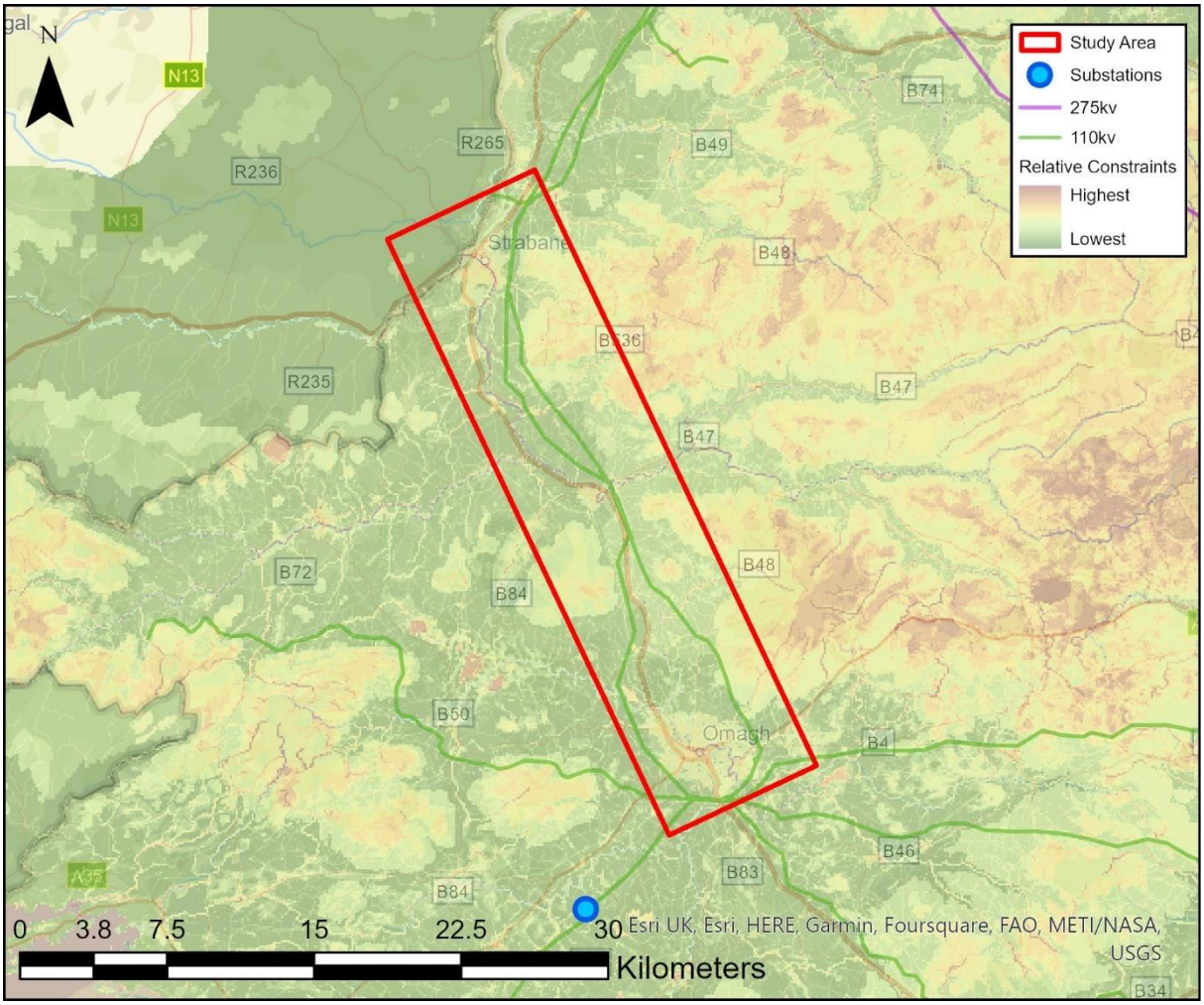
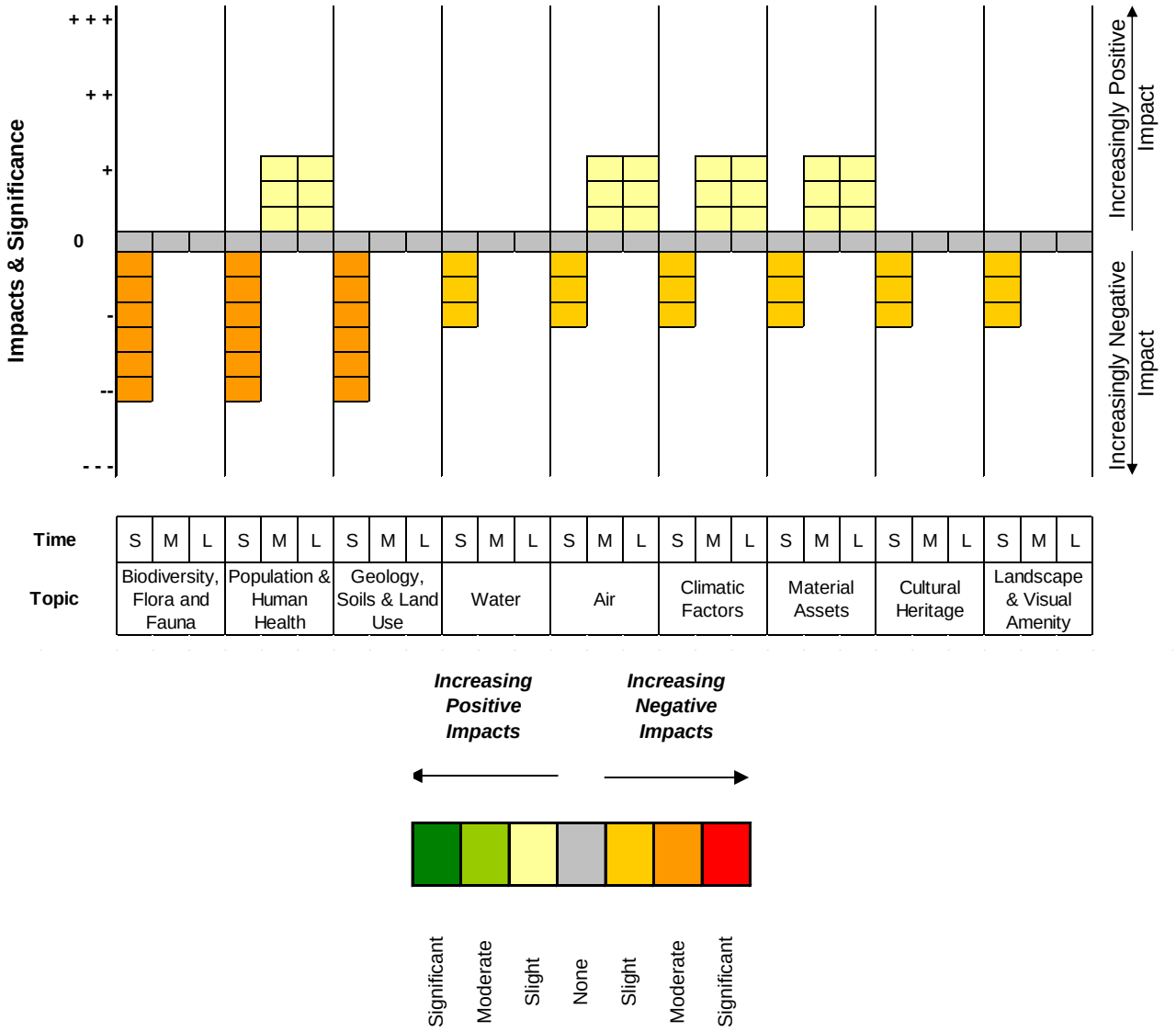
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-2	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-1	0	0
Landscape & Visual Amenity (L)	-1	0	0

Summary Chart of Potential Effects



Key Conclusions:

Development of the restring of existing 110 kV overhead lines between Omagh and Strabane has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites, and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during

the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within an AONB and sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.14 Mid Antrim Upgrade – Project 14

Mid Antrim Upgrade – New Substation and Transmission Line, Transmission Line Restring / Uprate

It is proposed to install a new 110 kV circuit from Terrygowan to Rasharkin (mostly overhead line, route TBD); a new substation at Terrygowan; and to uprate the Kells - Terrygowan 110 kV double circuit overhead line. The wider study area has been determined in GIS as well as a 1% least cost corridor, 50% least cost area and uprate area. For assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There is one SAC within the study area, namely the Garron Plateau SAC. Within the study area there are two SPAs (Antrim Hills SPA and Lough Neagh and Lough Beg SPA), and two RAMSAR sites (Garron Plateau, and Lough Neagh and Lough Beg). The study area crosses eight ASSIs, namely Ballymacombs More, Culnafay, Garron Plateau, Glarryford, Killydonnelly, Lough Beg, Rathsherry and Tardree Quarry. In total, there are ten SLNCIs crossed by the study area, namely Ballymacombs More, Drumack Bog, Drumbolcan, Long Mountain Bogs, Lough Beg (Mullanakil), Lough Beg (Newferry), McCallen's Town, Saugh Island, Tyranee and Whitehill. Within the study area there is one National Nature Reserve at Lough Beg, which is also a designated RSPB Reserve. Within the study are there are 24 Salmonid Rivers, namely Ahoghill Burn, Artoges River, Braid River Lower, Braid River Lower Middle, Braid River Lower Upper, Cashel Burn (Braid), Clady River, Clough River, Culmore River, Deerfin Burn, Devenagh Burn, Dunnstown Burn, Iverrow Water, Kells Water, River Bann, River Main, Skerry Water and Tullykittagh Water, and one Salmonid Lake (Lough Beg).

Population & Human Health - There are 14 main settlements within the study area, namely Aghoghill, Ballymena, Broughshane, Clady, Clogh, Cullybackey, Glenone, Grange Corner, Groggan, Kells/Connor,

Martinstown, Moneyglass, Portglenone and Rasharkin. The study area has a mean population density of 18.7 people / km^2. The study area encompasses one Neighbourhood Renewal Area, namely Ballymena, and there are also areas of lower perceived health within Ballymena. There are no peace lines within the study area.

Geology, Soils & Land Use – The study area covers 518.3 km^2 and is composed of coniferous woodland (3%), improved grassland, (46%), mountain heath and bog (6%), semi-natural grassland (20%), arable land (3%), coniferous woodland (3%) and urban / suburban land (10%). There are five ASSIs designated for geological features, namely Ballymacombs More, Culnafay, Garron Plateau, Glarryford and Tardree Quarry. There are 165 ancient woodland areas (Antrim, Ballymena, Ballymoney and Magherafelt, 65 of which are classed as lost) scattered throughout the study area, as well as nineteen Forest Service sites, which are part of Tardee, Portglenone, and Bann Woods South woods. There are 45 areas of unstable ground identified within the study area comprising peat, as well as nine upland areas. Within the study area there are 21 PPC sites (e.g., Michelin Tyres PLC, Clinty Chemicals Ltd) and 516 historical sites that have the potential of being contaminated land. There are 36 abandoned mines located within the study area.

Water – Within the study area there are 33 WFD rivers. Of these, 13 have Good WFD ecological status, while the remaining 20 have less than Good ecological status, with the majority (14) considered as Moderate ecological status. There are 1222 river segments contained within the study area. Within the study area there is one WFD lake (Lough Beg) which is of Poor ecological status. The study area contains three drinking water rivers, namely Artoges River, Braid River and Glenravel Water. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Ballymena, Newferry, Clady, Portneglone, Glarryford, Broughshane, Caddy and Kells areas. There are areas with 0.5% AEP pluvial flood risk widespread throughout the study area, particularly between Ballymena and Broughshane, as well as between Glarryford and McGergor's Corner.

Air – Within the study area there are two AQMAs of Ballykeel AQMA and Linenhall Street (Ballymena AQMA No. 3).

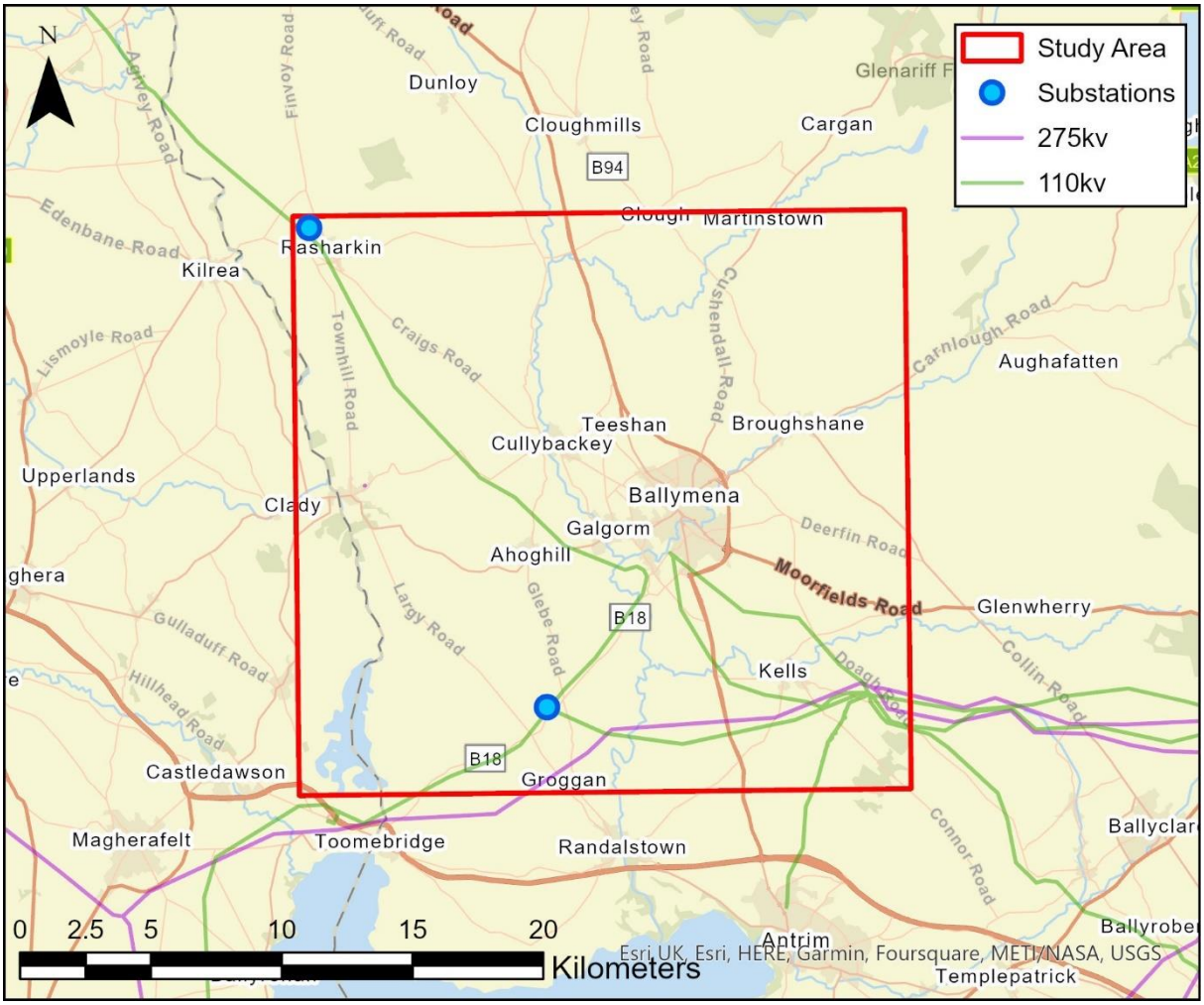
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Ballymena, Lough Beg, Newferry, Clady, Portneglone, Glarryford, Broughshane, Caddy and Kells areas. There are areas with 0.5% AEP climate change pluvial flood risk widespread throughout the study area, particularly between Ballymena and Broughshane, as well as between Glarryford and McGergor's Corner.

Material Assets – Within the study area there are 63 km of A roads, 149 km of B roads, 496 km of minor roads, 22 km of dual carriageway, 85 km of <4M tarred roads and 11 km of motorway. There is c. 43 km of railway line within the study area. Within the study area there is a gas transmission link to the NW Pipeline, and 26 electrical transmission lines, nine of which are 275 kV OHLs and 17 of which are 110 kV OHLs. Within the study area there is 435 km^2 of agricultural land, this is comprised of 1.63 km^2 of non-irrigated arable land, 3.3 km^2 of complex cultivation patterns and 430 km^2 of pastures.

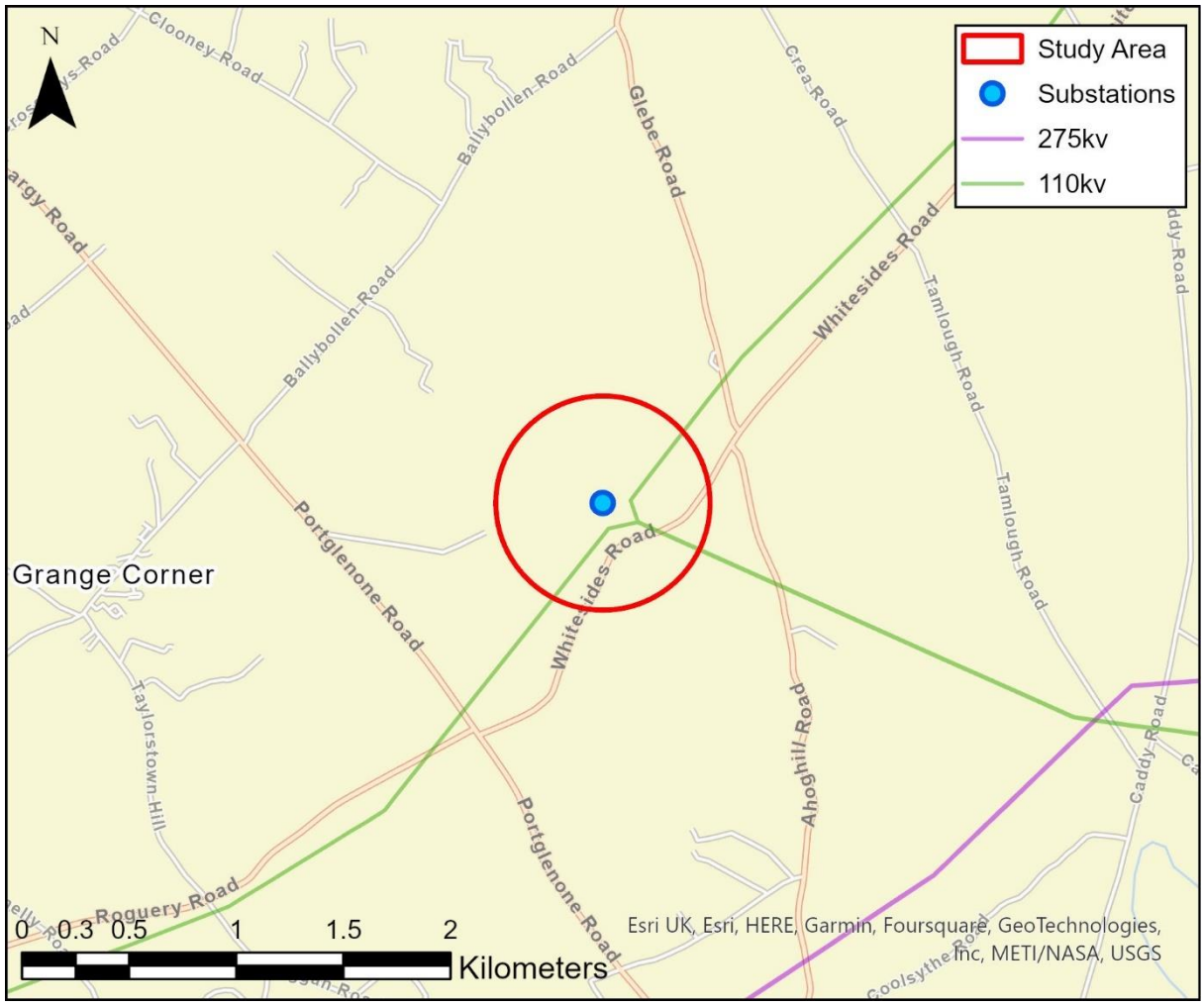
Cultural, Architectural & Archaeological Heritage – Within the study area there are 644 SMR sites and 60 Scheduled Zones (e.g., churches, castles, and raths). The study area contains 327 Listed Buildings, 610 Industrial Heritage areas and 148 Defence Heritage areas. There are seven Parks and Gardens that are contained within or intersect the study area, namely Hill Mount, Craigdun, Glebe House, Portglenone House, Peoples Park Ballymena, Random Cottage and Ballyscullion House.

Landscape & Visual Amenity – There are nine LCAs within the study area, of which three are of High sensitivity (Lower Bann Valley LCA, Tardee and Six Mile Water Slopes LCA, and Central Ballymena Glens LCA), four are of Medium / High sensitivity (Cullybackey and Clogh Mills Drumlins LCA, River Main Valley LCA, Ballymena Farmland LCA and Garron Plateau LCA), and two are of Medium / Low sensitivity (Long Mountain Ridge River Main Valley LCA and Tardee Upland Pastures LCA). The Antrim Coast and Glens AONB is the only AONB that is intersected by the study area.

Study Area

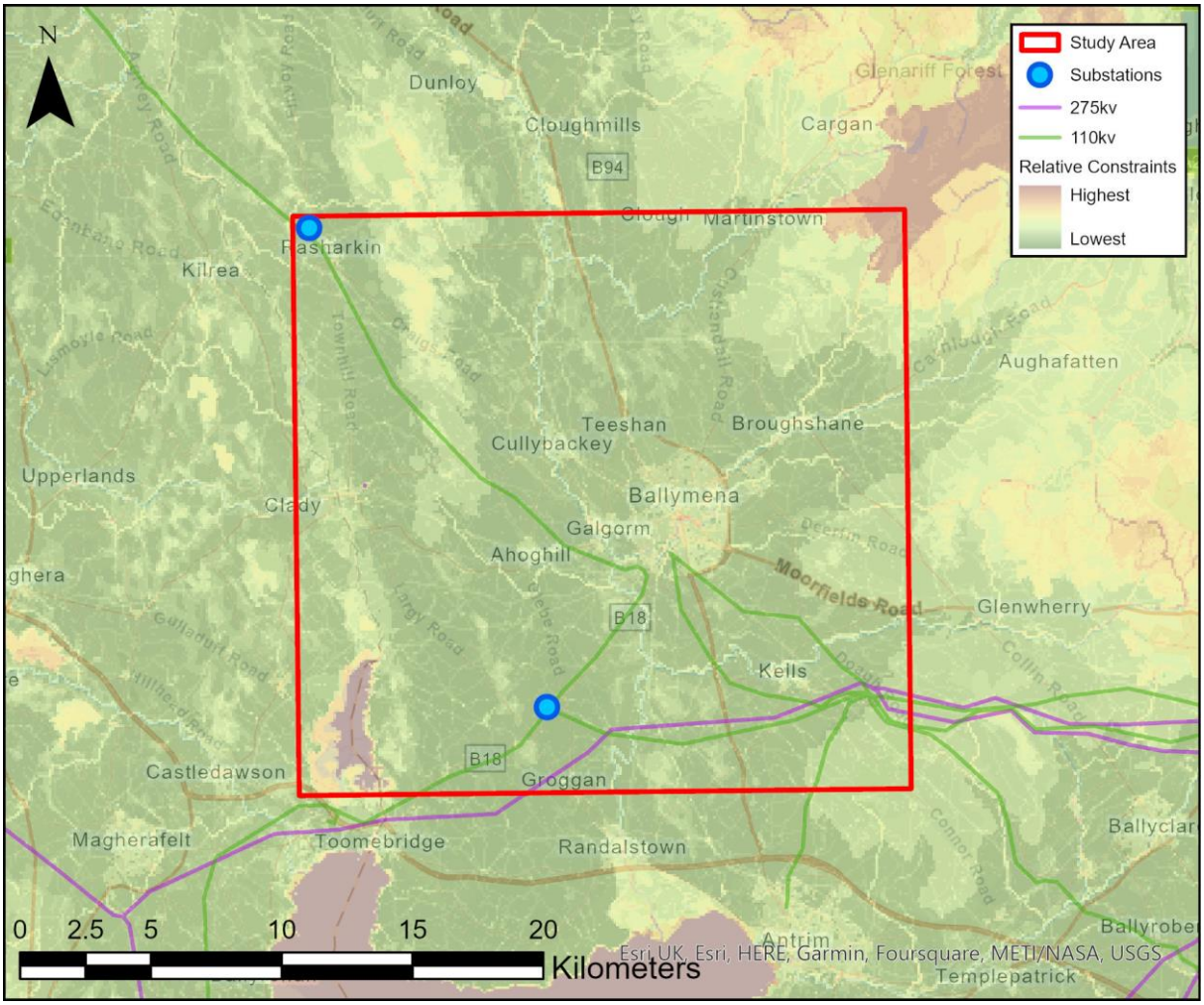


Mid Antrim Upgrade Study Area

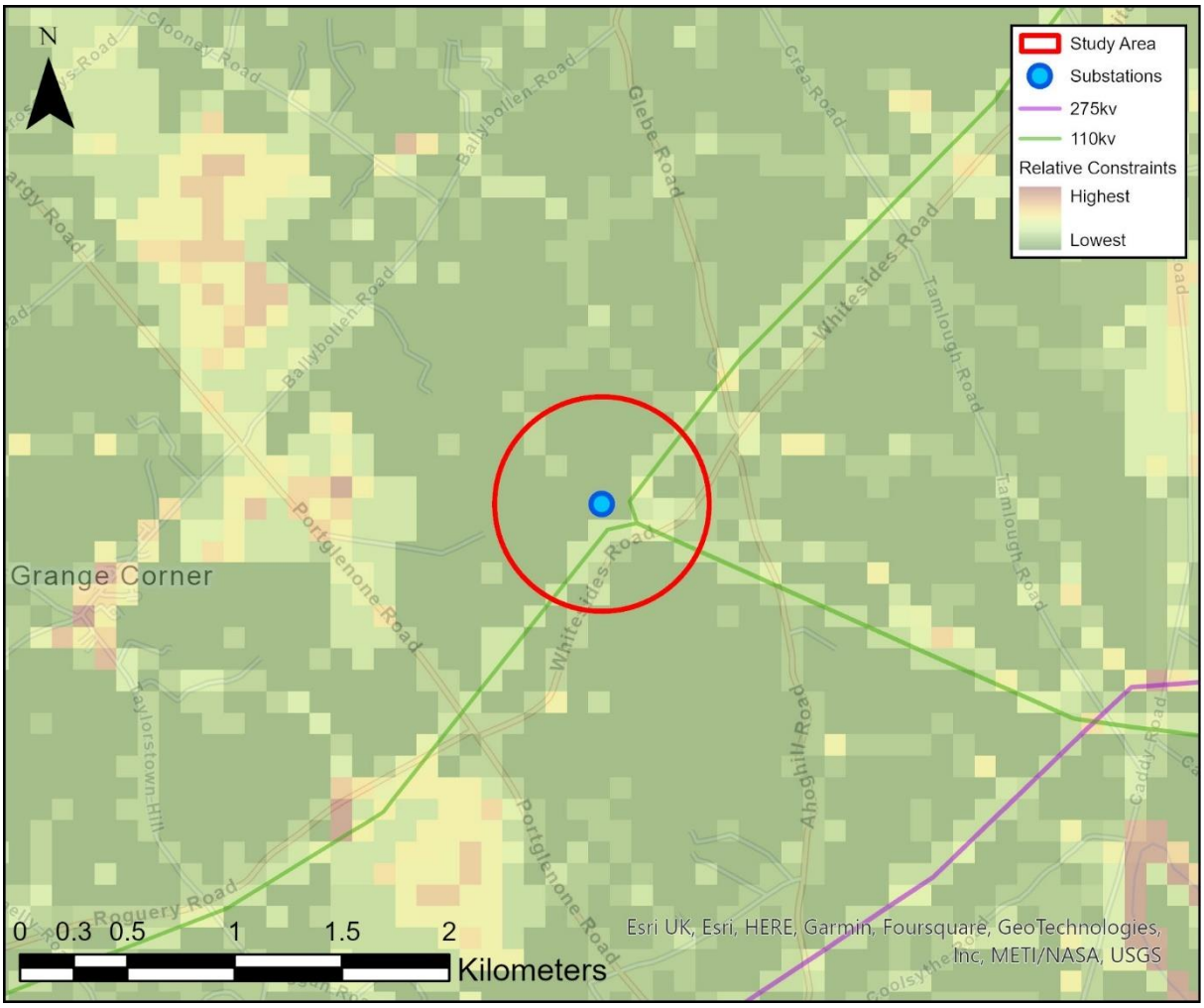


Terrygowan Substation Study Area

Constraints Model



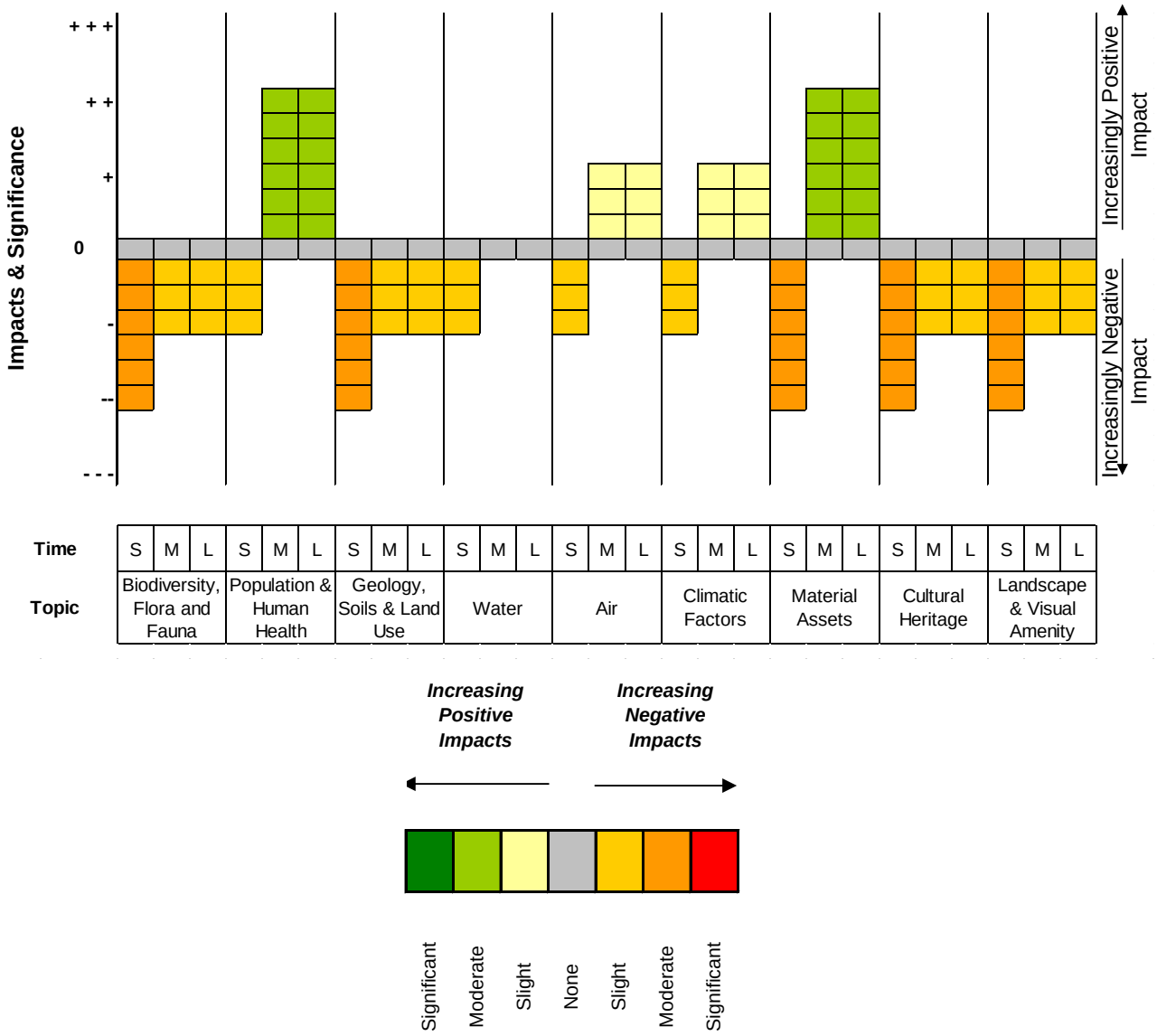
Mid Antrim Upgrade Study Area Constraints



Terrygowan Substation Study Area Constraints

Environmental Assessment			
Environmental Topic	**Short-Term Effects**	**Medium-Term Effects**	**Long-Term Effects**
Biodiversity, Flora & Fauna (BFF)	-2	-1	-1
Population & Human Health (PHH)	-1	+2	+2
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-2	+2	+2
Cultural, Architectural & Archaeological Heritage (CH)	-2	-1	-1
Landscape & Visual Amenity (L)	-2	-1	-1

Summary Chart of Potential Effects



Key Conclusions:

Development of the Mid Antrim upgrade, comprising a new substation at Terrygowan, new 110 kV circuit from Terrygowan to Rasharkin, and uprate of the Kells to Rasharkin 10 kV OHL, has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites, and Salmonid Rivers, and for short- to long-term, direct or indirect impacts on local designated sites (-1). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in non-sensitive areas (-1); there is the potential for slight to moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+2). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation and OHL structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term,

temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, moderate negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-2); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for medium- or long-term slight impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs during the restring (-2), and short- to long-term permanent negative impacts on Landscape and Visual Amenity within non-sensitive areas from the substation and new line development (-1).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.15 Northwest 110 kV Reinforcement – Project 15

Northwest 110 kV Reinforcement – New Transmission Line

It is proposed to install a new 110 kV circuit from Cam Cluster to Rasharkin; the route is TBD. The wider study area has been determined in GIS and the project includes a 1% least cost corridor.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there is one SAC, namely Carn – Glenshane Pass. There are nine ASSIs within the study area, namely Ballymacallion, Brockagh Quarry, Carn/Glenshane Pass, Coolnasillagh, Craigs, Errigal Glen, Smulgedon, Tamnyrankin and Tully Hill. In total, 34 SLNCIs are located within the study area. Within the study area there are 23 Salmonid Rivers, namely Aghadowey River Lower, Aghadowey River Upper, Agivey River Lower, Agivey River Upper, Ballmoney River Lower, Ballymoney River Upper, Boleran Burn, Brockagh Water, Cam Burn, Castle River, Culmore River, Curly River, Drumawhiskey River, Formil River, Gelvin River, Inverrow Water, Knockoneill River, Macosquin River, Mayoghill River, Mettican River, River Bann (Lower Mid Reach) and River Bann (Lower Reach).

Population & Human Health - There are 16 main settlements within the study area, namely Ballymoney, Balnamore, Bendooragh, Boleran, Boveedy, Carneatly, Calrehill, Craigavole, Drumagarner, Dunaghy, Finvoy, Garvagh, Glenkeen, Glenullin, Kilrea and Rasharkin. The mean population density of the study area is 11.2 people / km^2. Within the study area there are no Neighbourhood Renewal Areas or peace lines. There are areas of lower perceived health within Ballymoney.

Geology, Soils & Land Use – The study area covers approximately 440.6 km^2 and is comprised of broadleaf woodland (8%), coniferous woodland (7%), arable land (1%), improved grassland (41%), semi-natural grassland (26%), mountain heath and bog (14%), and suburban land (1%). There is on ASSI designated for geological features, namely Tully Hill ASSI. Within the study area there are 100 ancient woodland areas (20 of which are lost), as well as 34 Forest Service sites including Aghadowey, Bann Woods North, Bann Woods South, Cam, Craigs, Garvagh, Gortmoyagh and Springwell. There are 56 areas of

unstable land comprised of peat throughout the study area, and seven upland areas, which are mainly located in the west. Within the study area there are 14 PPC sites and 352 historic land use areas that have the potential to be contaminated (e.g., textile works and dye works, mineral workings, airports). There is one quarry within the study area, located off the Finvoy Road south of Ballymoney, and one landslide deposit.

Water – Within the study area there are 23 WFD rivers, of which 13 are of Good ecological status, namely Agivey River (Glen Ullin), Inverroe Water, Knockoneill River, Macosquin River (Macosquin), Shinney Water, Agivey River (Bovagh), Mettican River, Brockagh Water, Agivey River (Garvagh), Mayoghill River, Curly River, Castle River and Gelvin River (Lenamore). The remaining ten are of less than Good status. There are 1076 river segments within the study area. Two drinking water rivers run through the study area, namely Macosquin River and River Bann. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, mostly located along the River Bann, as well as including the Milltown, McLaughlin's Corner, Garvagh, Brockagh, Kilrea, Agivey, Ringsend and Finvoy areas. There are areas with 0.5% AEP pluvial flood risk widespread throughout the study area, with significant areas located mostly to the east of the River Bann within the Finvoy, McLoughlin's Corner, Rasharkin and Bendooragh, as well as in the west around the Ringsend, Garvagh, Brockagh and Craigarole areas.

Air – There are no AQMAs or any other known air quality issues within the study area.

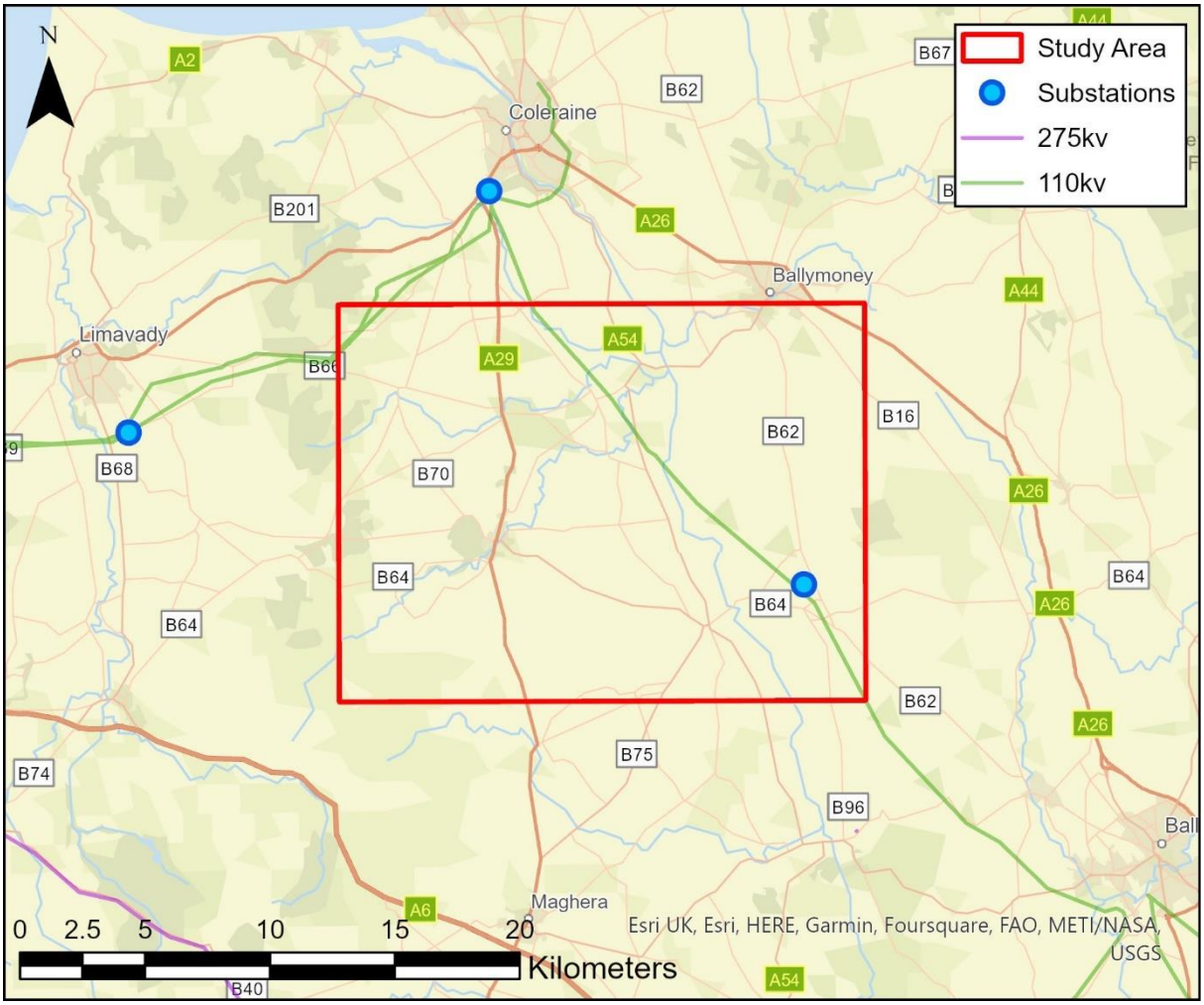
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, mostly located along the River Bann, as well as including the Milltown, McLaughlin's Corner, Garvagh, Brockagh, Kilrea, Agivey, Ringsend and Finvoy areas. There are areas with 0.5% AEP climate change pluvial flood risk widespread throughout the study area with significant areas located mostly to the east of the River Bann within the Finvoy, McLoughlin's Corner, Rasharkin and Bendooragh, as well as in the west around the Ringsend, Garvagh, Brockagh and Craigarole areas.

Material Assets – There are 37 km of A road, 101 km of B road, 41 km of <4M tarred road and 281 km of minor road within the study area. Approximately 7 km of railway line runs through the study area. Within the study area there is gas transmission via the NW Pipeline, and three electrical transmission lines, all of which are 110 kV OHLs. Within the study area there is 276 km^2 of agricultural land; this is comprised of 5 km^2 of complex cultivation patterns, 3.3 km^2 of land principally occupied by agriculture and 268 km^2 of pastures.

Cultural, Architectural & Archaeological Heritage – Within the study area there are 437 SMRs and 45 Scheduled Zones (e.g., court tombs, earthworks, raths, passage tombs). The study area contains 226 Listed Buildings, 448 Industrial Heritage areas e.g., bridges, mileposts, flax mill sites), 154 Defence Heritage areas (e.g., Mullaghmore Airfield, Kilrea ROC post), and three Areas of Archaeological Potential, located at Ballymoney, Garvagh and Kilrea. There are also six Parks and Gardens within the study area, namely Bovagh House, Leslie Hill, Lizard Manor, Moore Fort, Moore Lodge and O Harabrook.

Landscape & Visual Amenity – The study area intersects ten LCAs, of which four are of High sensitivity (Coleraine Farmland LCA, Glenshane Slopes LCA, Lower Bann Floodplain LCA and the Lower Bann Valley LCA), four are of Medium sensitivity (Binevenagh LCA, Eastern Binevenagh Slopes LCA, Garvagh Farmland LCA, and Roe Basin LCA), and two are of Low sensitivity (Dervock Farmlands LCA and Long Mountain Ridge LCA) to development. The study area also intersects two AONBs, Binevenagh AONB and Sperrin AONB.

Study Area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Study Area
Substations
275kv
110kv
Coleraine
Ballymoney
Limavady
Maghera
A2
B62
B67
B201
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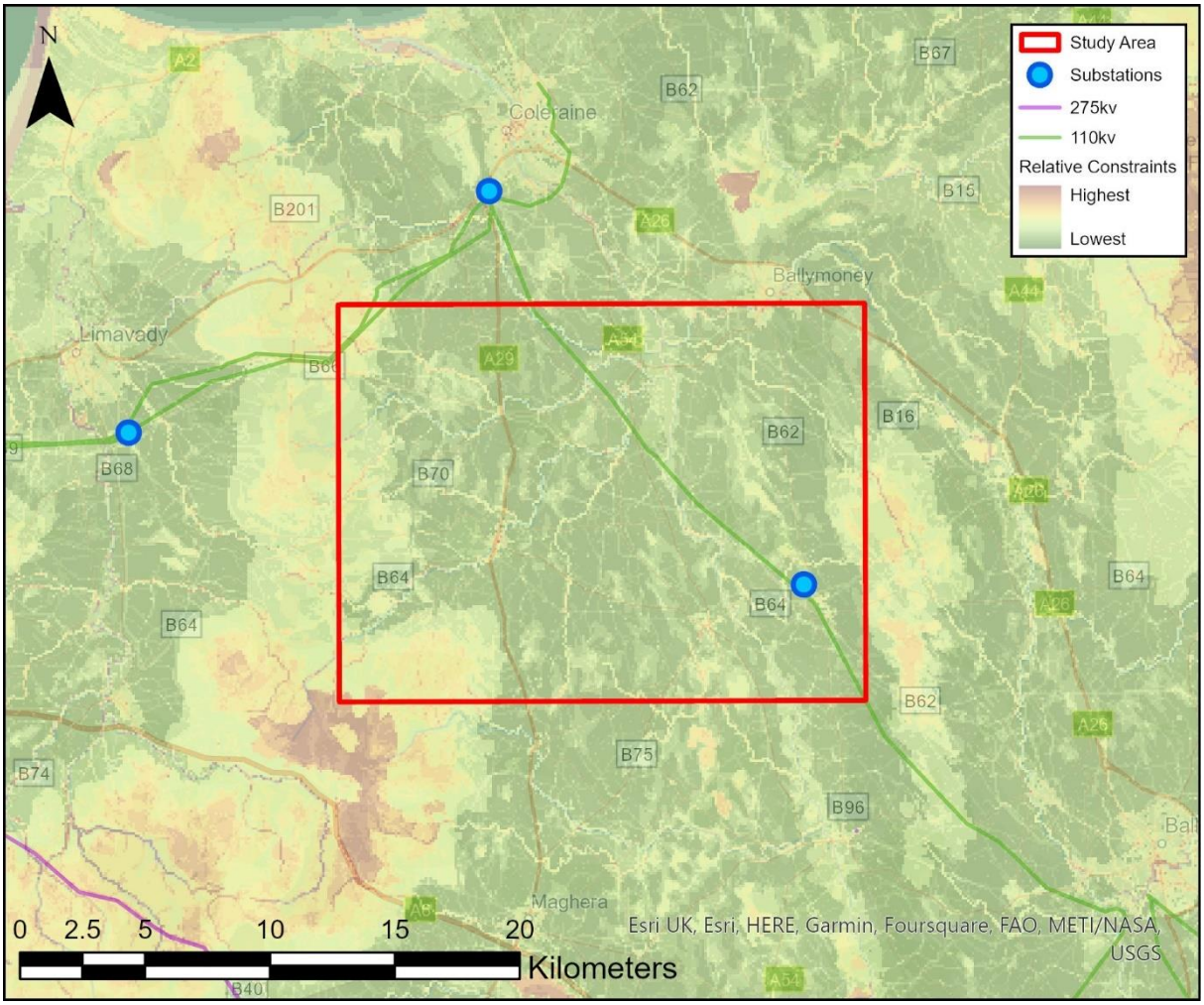
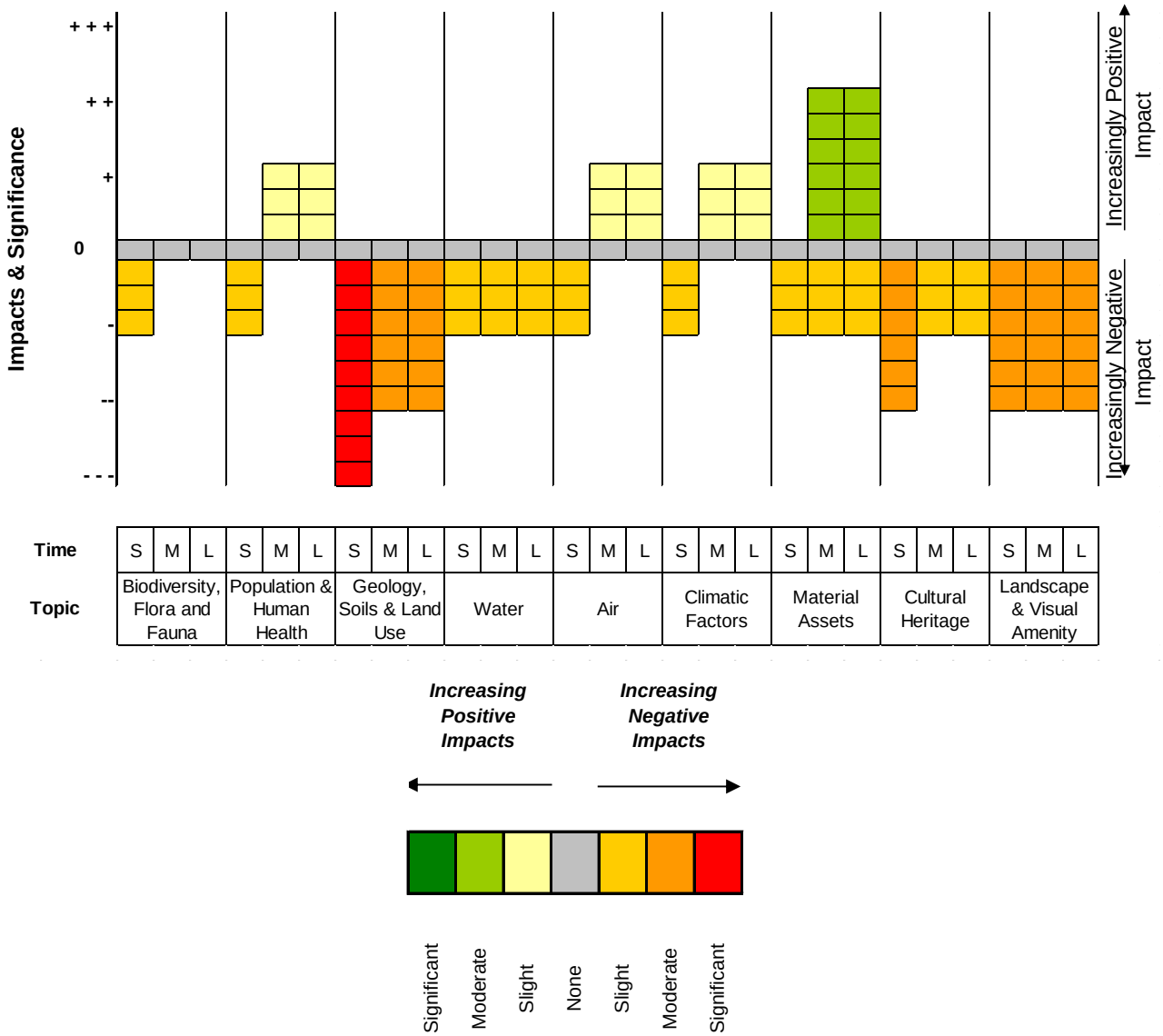
A44
A54
A29
B66
B68
B70
B64
B16
B74
B75
B96
A6
B40
0 2.5 5 10 15 20
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS

Constraints Model	



Environmental Assessment			
Environmental Topic	**Short-Term Effects**	**Medium-Term Effects**	**Long-Term Effects**
Biodiversity, Flora & Fauna (BFF)	-1	0	0
Population & Human Health (PHH)	-1	+1	+1
Geology, Soils and Land Use (GSL)	-3	-2	-2
Water (W)	-1	-1	-1
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-1	-1 / +2	-1 / +2
Cultural, Architectural & Archaeological Heritage (CH)	-2	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of Northwest Reinforcement, comprising new 110 kV circuit from Cam Cluster to Rasharkin, has the potential for short-term, temporary, construction phase, slight negative impacts on a local designated site and protected species due to potential hydrological connectivity (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health, in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+1) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+1). There is the potential for direct or indirect, construction phase loss of, or damage to designated earth science features (-3), and the potential for short-, medium-, and long-term, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and permanent loss of soils and existing land uses (-2). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with numerous flood risk areas in the medium- to long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-

sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for medium- or long-term slight impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs and an AONB (-2).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on 27 European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.16 Omagh – Dromore Uprating – Project 16

Omagh - Dromore Uprating – Transmission Line Restring / Uprate

It is proposed to uprate the existing double circuit overhead line between Dromore and Omagh. The wider study area has been determined in GIS and includes an uprating area. For assessment purposes, the initial study area for the restring corridor has been set as 500 m either side of the existing line.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there is one SAC, namely Cranny Bogs SAC. The study area contains one ASSI, namely Cranny Bogs ASSI. There are six Salmonid Rivers within the study area, namely Camowen River, Drumragh River, Magheragart Burn, Owenreagh River, Quiggery Water and Strule River.

Population & Human Health – There are four main settlements within the study area, namely Clanabogan, Dromore, Edenderry and Omagh Town. The mean population density of this study area is 12.6 people / km^2. There are no peace lines within the study area. There are areas of lower perceived health, and a Neighbourhood Renewal Area within Omagh.

Geology, Soils & Land Use – The study area covers approximately 74.6 km^2, which is composed of broadleaf woodland (8%), semi-natural grassland (22%), urban / suburban land (7%), arable (1%), mountain heath and bog (3%), coniferous woodland (1%) and improved grassland (59%). There is one ASSI designated for geological features, namely Dromore ASSI. Within the study area there are two ancient woodland areas (Omagh), and three Forest Service sites, which are located at Pigeon Top and Trillick. There are eight areas of unstable peat ground that have been identified throughout the study area. Within the study area, three PPC sites south of Omagh, and 61 historical sites that have the potential of being contaminated land, have been identified (e.g., former railway land, textile works and dye works, and mineral workings).

Water – Within the study area there are nine WFD Rivers, all of which are of Moderate ecological status. These include Creevan Burn, Drumragh River, Quiggery Water, Magheragart Burn, Ballynahatty (Drumragh) Water, Owenreagh (Drumragh) River (Drumlish), Cranny Burn, Camowen River (Omagh) and Strule River. There are 191 river segments within the study area. The study area contains one drinking water river – Camowen River. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Omagh area as well as the rural areas surrounding the Owenreagh River and its tributaries in the west / south, the Quiggery Water in the east, the Drumragh River in the north, and the Ballynahatty Water in the centre of the study area. There are areas with 0.5% AEP pluvial flood risk widespread throughout the study area, including the rural areas to the west of Dromore in the south, Lough Muck and Fireagh Lough in the northwest, and rural areas within the centre of the study area.

Air – There are no AQMAs or other known air quality issues within the study area.

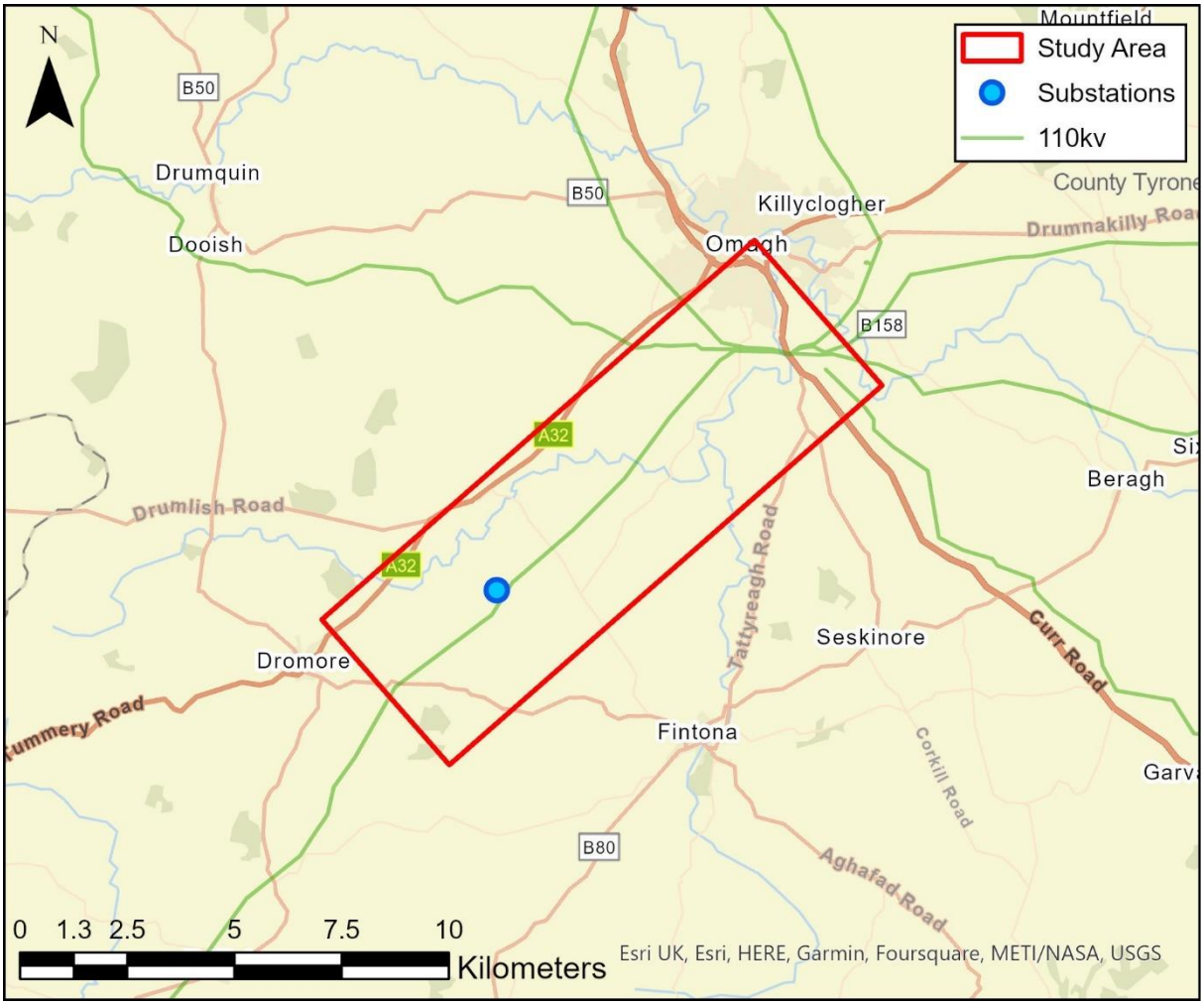
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Omagh area as well as the rural areas surrounding the Owenreagh River and its tributaries in the west / south, the Quiggery Water in the east, the Drumragh River in the north, and the Ballynahatty Water in the centre of the study area. There are areas with 0.5% AEP climate change pluvial flood risk widespread throughout the study area, including the rural areas to the west of Dromore in the south, Lough Muck and Fireagh Lough in the northwest, the Omagh area, and rural areas within the centre of the study area.

Material Assets – Within the study area there are 13 km of A roads, 8 km of B roads, 67 km of <4M tarred roads and 38 km of minor roads. Within the study area there are eleven 110 kV OHLs. Within the study area there is 56 km^2 of agricultural land; this is comprised of 2.84 km^2 of land principally occupied by agriculture and 53.1 km^2 of pastures.

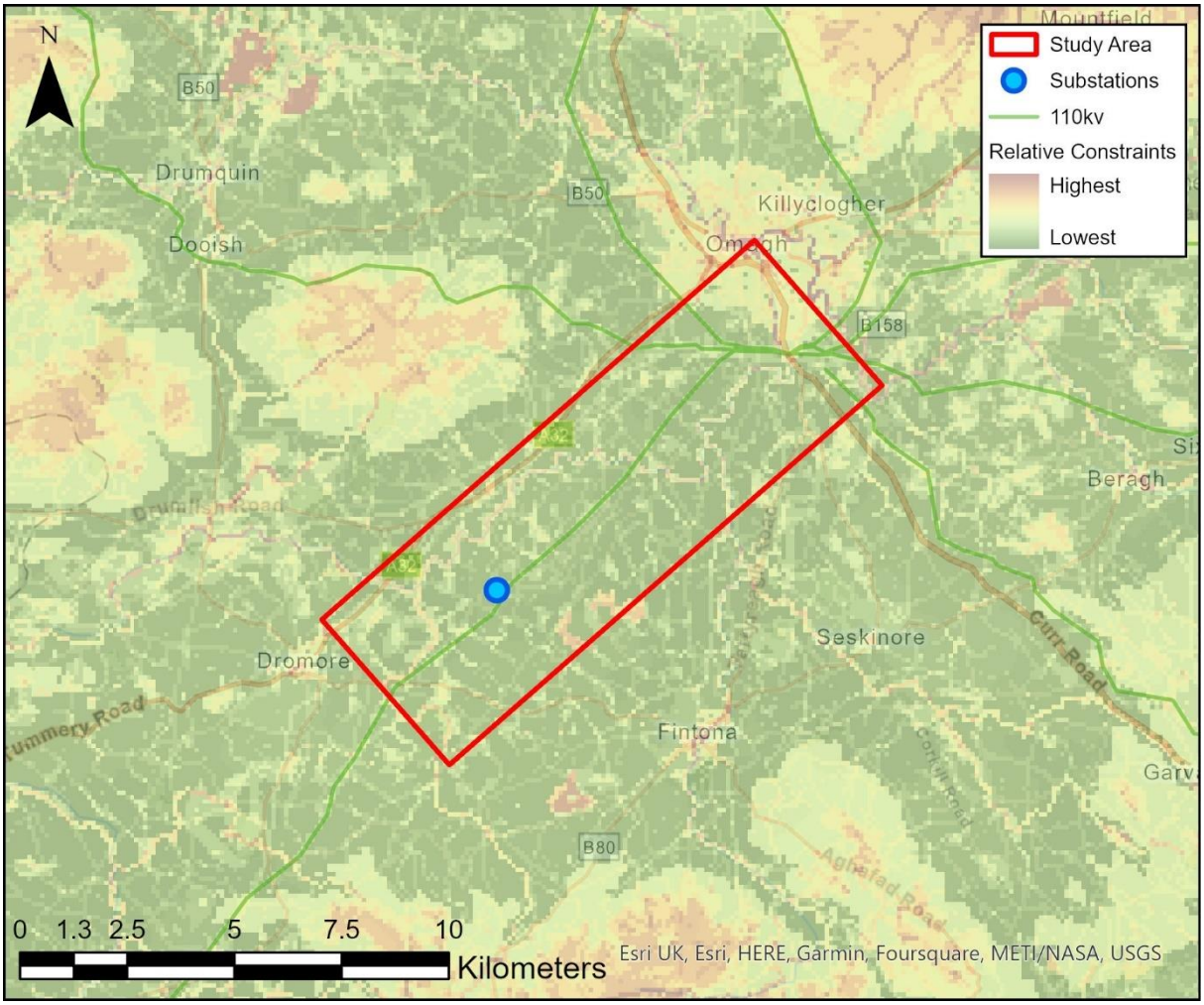
Cultural, Architectural & Archaeological Heritage – Within the study area there are 41 SMR sites and four Scheduled Zones (Church and raths). The study area contains 49 Listed Buildings and 87 Industrial Heritage areas. Additionally, two Parks and Gardens are located within the study area, namely Creevenagh and Edenfel.

Landscape & Visual Amenity – Within the study area there are two LCAs, Irvinestown Farmland and Omagh Farmland, both of which have a Medium / High sensitivity to development.

Study Area


N
Study Area
Substations
110kv
B50
Drumquin
Dooish
B50
Killyclogher
Omagh
County Tyrone
Drumnakilly Road
B158
A32
Drumlish Road
A32
Beragh
Tattyreagh Road
Seskinore
Curr Road
Dromore
Fintona
Corkill Road
B80
Aghafad Road
0 1.3 2.5 5 7.5 10
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

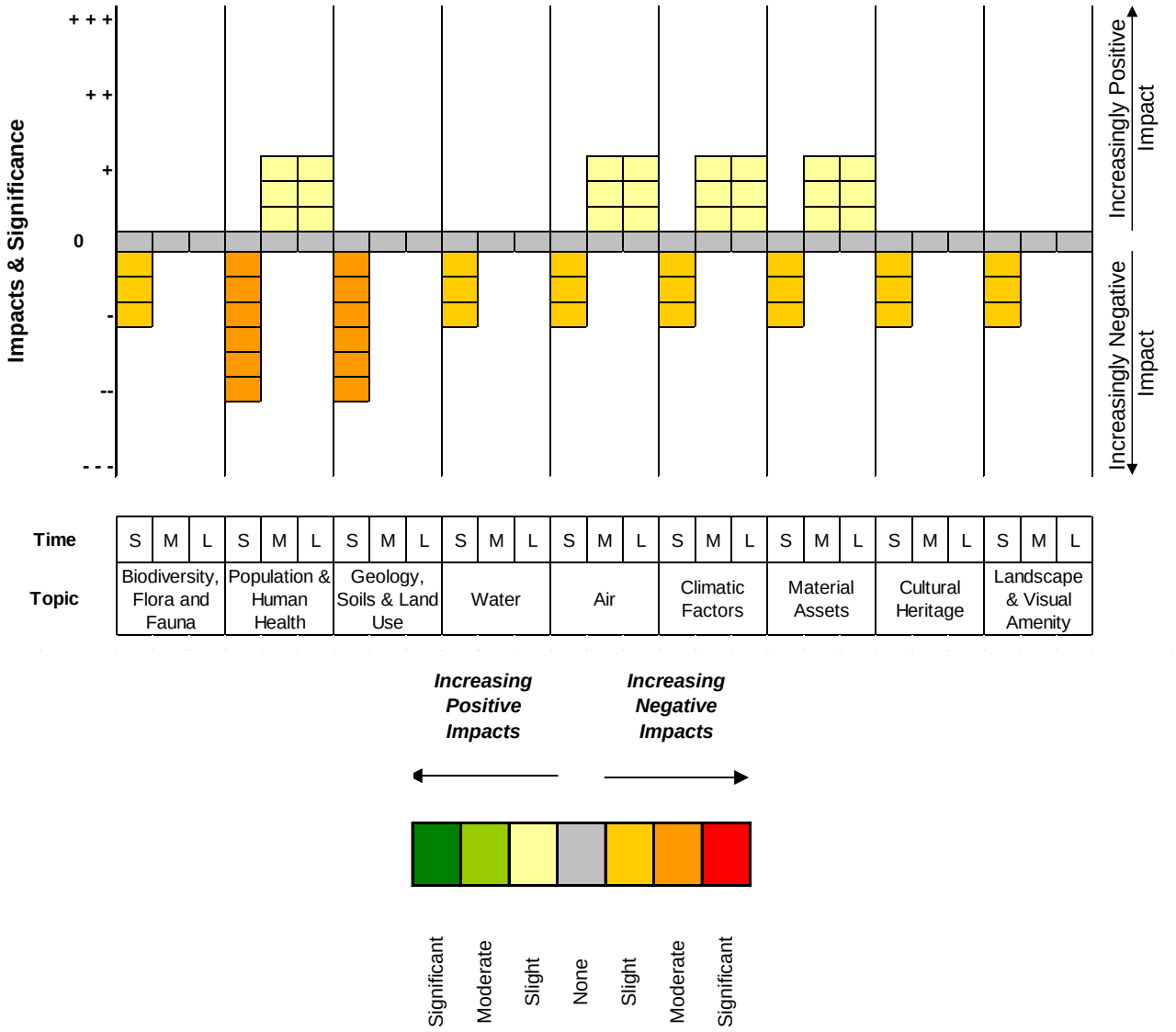
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-1	0	0
Population & Human Health (PHH)	-2	+1	+1
Geology, Soils and Land Use (GSL)	-2	0	0
Water (W)	-1	0	0
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-1	+1	+1
Cultural, Architectural & Archaeological Heritage (CH)	-1	0	0
Landscape & Visual Amenity (L)	-1	0	0

Summary Chart of Potential Effects



Key Conclusions:

Development of the restring of existing overhead lines between Omagh and Dromore has the potential for short-term, temporary, construction phase, slight negative impacts (-1) on Biodiversity Flora and Fauna, including to Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight to moderate negative disturbance impacts on Population and Human Health, including within some higher population density and socially sensitive areas (-2); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1). There is the potential for short-term, temporary, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2); there are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area in the medium- or long-term, in the development of this uprate (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the restring (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for

slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure during the restring (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the restring (-1); there are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following these works (0). There is the potential for short-term, temporary, construction phase, slight, negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-1); there are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting (0).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on three European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.17 Mid Tyrone Upgrade – Project 17

Mid Tyrone Upgrade – New Transmission Line and Underground Cables

It is proposed to install a new 110 kV circuit from Dromore to Tamnamore – this would mostly comprise overhead line but is anticipated to have c. 6km of cable at the Eastern end. The route is TBD. The study area has been determined in GIS and includes a 1% least cost corridor.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There are two SACs within the study area, namely Cranny Bogs SAC and Tonnagh Beg Bogs SAC. The study area crosses six ASSIs, Annaghagh Bog, Black Lough (Tyrone) Cranny Bogs, Dromore, Glenmore Wood and Tonnagh Beg Bog. In total, there are 19 SLNCIs crossed by the study area. Within the study are there are 30 Salmonid Rivers. The Ballinderry, Colebrooke and Tempo Freshwater Pearl Mussel Catchments also intersect the study area.

Population & Human Health - There are 25 main settlements within the study area. The study area has a mean population density of 11.8 people / km^2. The study area encompasses two Neighbourhood Renewal Areas, in Coalisland and Dungannon, and there are areas of lower perceived health within Dungannon and Fintona. There are no peace lines within the study area.

Geology, Soils & Land Use – The study area covers 525.5 km^2 and is composed of coniferous woodland (2%), improved grassland (61%), mountain heath and bog (11%), semi-natural grassland (15%), arable land (1%), broadleaf woodland (7%) and urban / suburban land (3%). There is one ASSI designated for geological features, namely Dromore ASSI. There are 300 ancient woodland areas scattered throughout the study area, as well as 77 Forest Service sites. There are 56 areas of unstable ground comprised of peat identified within the study area, as well as 22 upland areas (Altmore, Caledon, Clabby, Dunmoyle, Favour Royal, Knockmany, Parkanaur, Pigeon Top, Seskinore, Trillick). Within the study area there are 47 PPC sites and 624 historical sites that have the potential of being contaminated land. There are 22 abandoned mines located within the study area and six quarries.

Water – Within the study area there are 38 WFD rivers, four of which have Good ecological status (Knockmany Burn (Blackwater), River Blackwater Tributary (Ballygreenan), River Blackwater Tributary (Killyfaddy) and Trillick Tributary); the remaining 34 have less than Good ecological status, with the majority (23) being of Moderate ecological status. There is connectivity to the Republic of Ireland via these waterbodies. There are 1738 river segments contained within the study area. The study area contains four drinking water rivers, namely Camowen River, Many Burns River, River Blackwater and Torrent River. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Dromore, Seskinore, Dungannon, Castlecaufield, Fintona and Donaghmore areas. There are areas with 0.5% AEP pluvial flood risk widespread throughout the study area, with significant areas around the Dromore, Dungannon, Seskinore, Castlecaulfield and Fintona areas.

Air – Within the study area there are three AQMAs of Armagh City, Banbridge and Craigavon Borough Council AQMA, The Moy AQMA, and The Newell Road (Dungannon) AQMA.

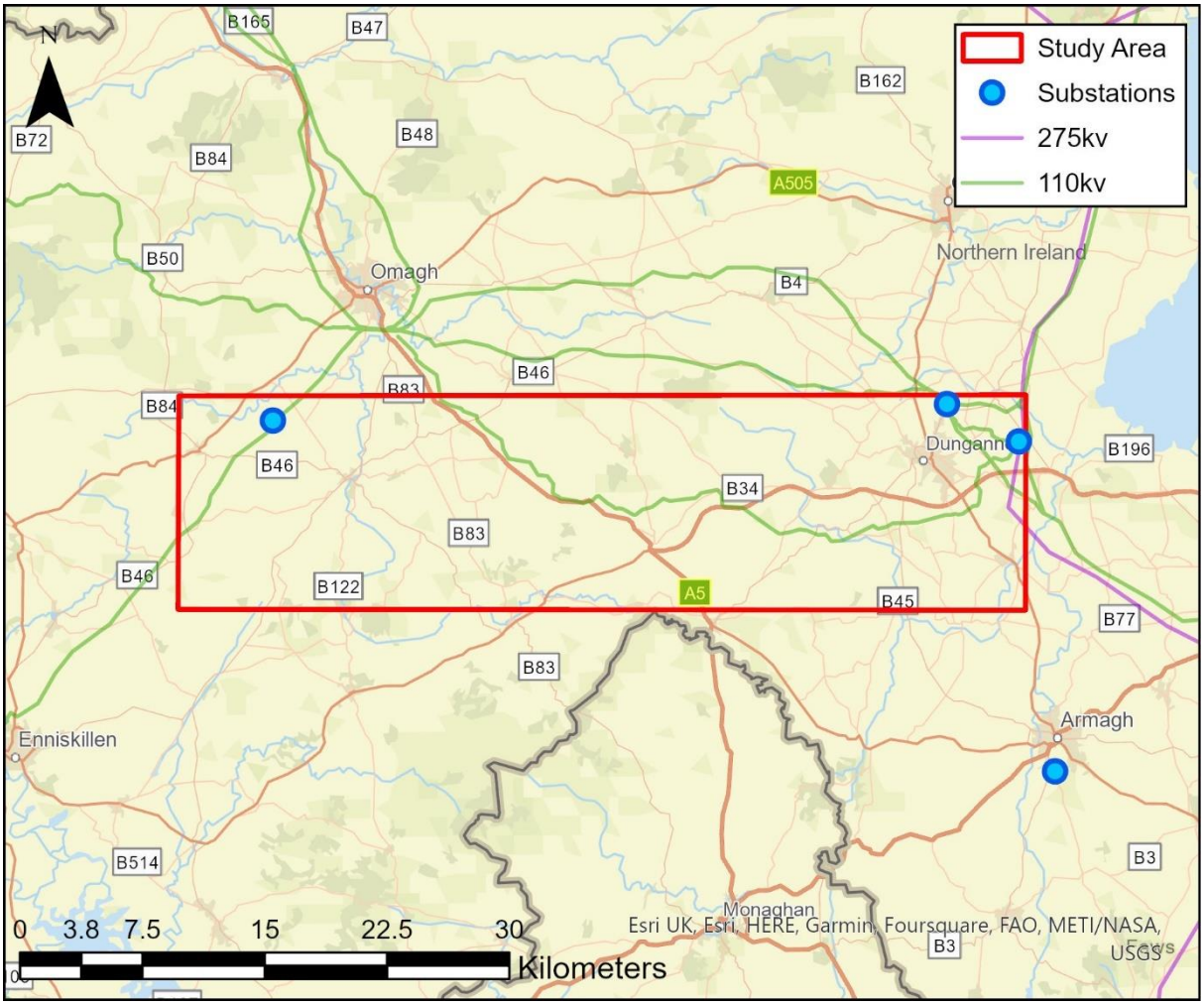
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Dromore, Seskinore, Dungannon, Castlecaufield, Fintona and Donaghmore areas. There are areas with 0.5% AEP climate change pluvial flood risk widespread throughout the study area, with significant areas around the Dromore, Dungannon, Seskinore, Castlecaulfield and Fintona areas.

Material Assets – Within the study area there are 45 km of A roads, 60 km of B roads, 126 km of minor roads, 356 km of <4M tarred roads, 0.5 km of dual carriageway and 5 km of motorway. Within the study area there is a gas transmission link of Gas to the West, and 19 electrical transmission lines, two of which are 275 kV OHLs and 17 of which are 110 kV OHLs. Within the study area there is 254 km^2 of agricultural land; this is comprised of 6.52 km^2 of land principally occupied by agriculture and 247 km^2 of pastures.

Cultural, Architectural & Archaeological Heritage – Within the study area there are 574 SMR sites and 81 Scheduled Zones. The study area contains 404 Listed Buildings, 734 Industrial Heritage areas, five Defence Heritage areas (Charlemont Fort, Clogher ROC monitoring post, Dungannon Park, Dungannon ROC post, and Seskinore House), and six Areas of Archaeological Potential located at Augher, Ballygawley, Carnteel, Castlecaulfield, Donaghmore and Dungannon. There are seven Parks and Gardens that are contained within or intersect the study area, namely Corick, Favour Rotal, Killybrick House, Killyfaddy Manor, Martray House, Parkanaur and Spur Royal, Augher Castle.

Landscape & Visual Amenity – There are ten LCAs within the study area, of which three are of High sensitivity (Blackwater Valley, Clogher Valley Lowlands and Lough Neagh Peatlands), seven are of Medium / High sensitivity (Brougher Mountain, Cookstown Farmlands, Dungannon Drumlins and Hills, Irvinestown Farmlands, Loughgall Orchard Belt and Omagh Farmland), and one is of Low sensitivity (Slievemore) to development.

Study Area


N
Study Area
Substations
275kv
110kv
B165
B47
B72
B84
B48
B162
A505
B50
Omagh
Northern Ireland
B4
B46
B83
B84
B46
Dungannon
B196
B34
B83
B46
B122
A5
B45
B77
B83
Enniskillen
Armagh
B514
B3
Monaghan
B3
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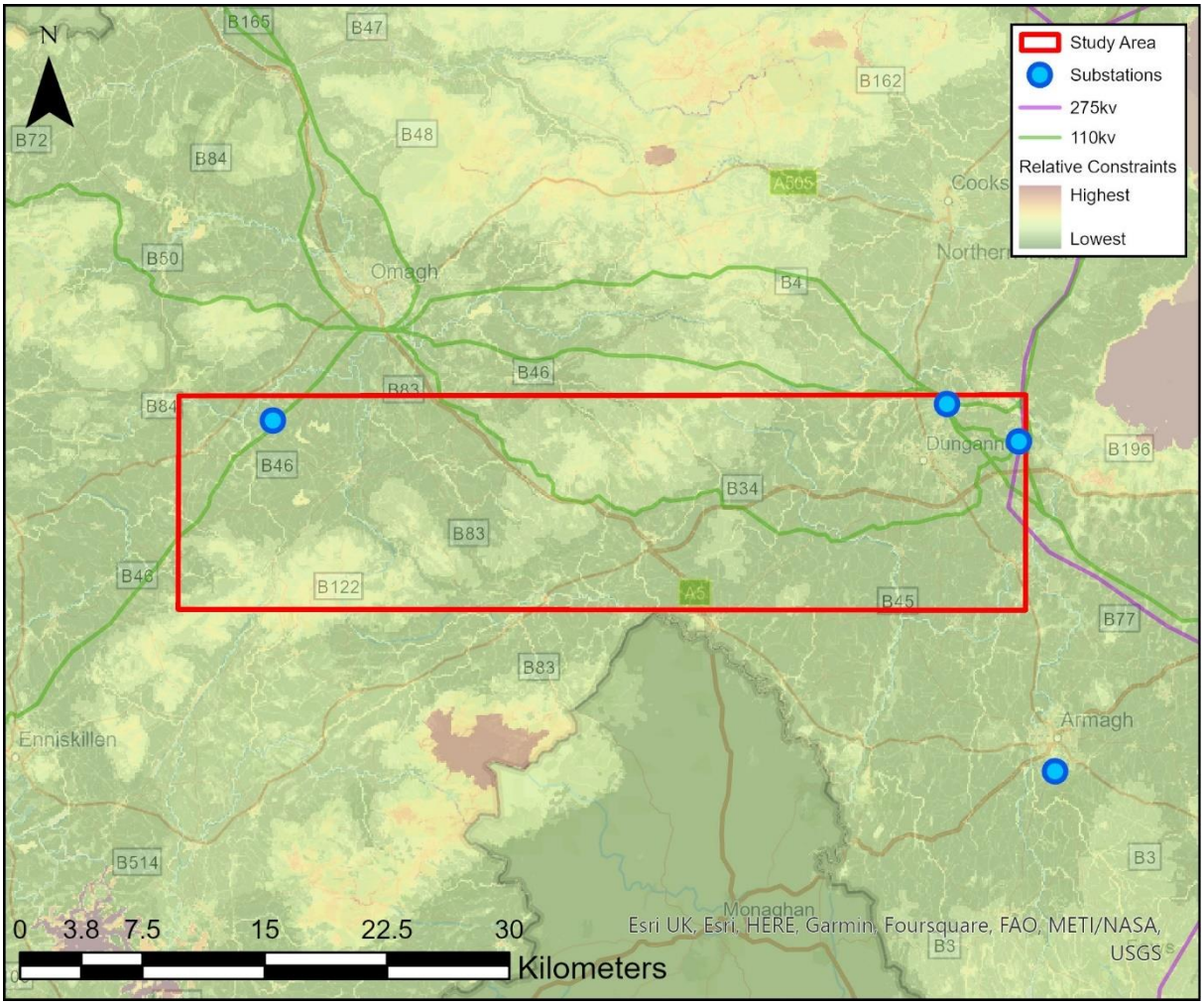
Kilometers
Esri UK, Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS

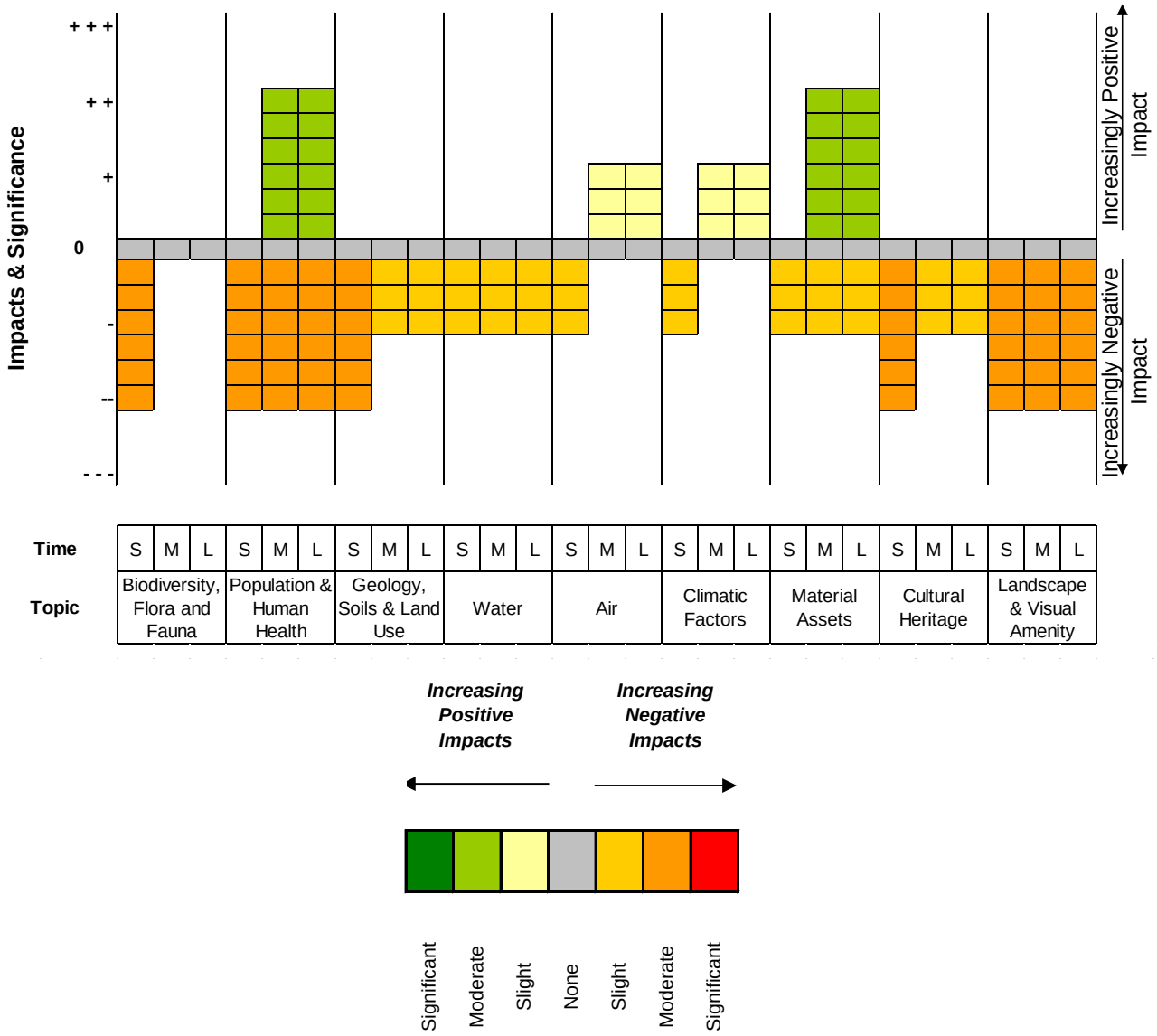
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-2	-2 / +2	-2 / +2
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	-1	-1
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-1	-1 / +2	-1 / +2
Cultural, Architectural & Archaeological Heritage (CH)	-2	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Mid Antrim upgrade, comprising new 110 kV circuit from Dromore to Tamnamore, has the potential for short-term, temporary, construction phase, indirect impacts on international, national, and local designated sites and Salmonid Rivers (-2). There is the potential for short-term, temporary, construction phase, moderate negative disturbance impacts on Population and Human Health, including in high population density and socially sensitive areas (-2), and long-term effects from the presence of new infrastructure in high population density and socially sensitive areas (-2); there is the potential for moderate positive impacts on Population and Human Health in the medium- and long-term owing to improvements to the existing transmission infrastructure (+2) and short-term to long-term employment opportunities from construction and operation of the new infrastructure (+2). There is the potential for short-term, moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and medium-, and long-term, slight negative effects on Geology, Soils and Land use due to permanent loss of soils and existing land uses in the footprint of the new line structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with numerous flood risk areas in the medium- to long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for

slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, to long-term permanent moderate negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on Cultural Heritage features or their settings, during the construction works (-2), and potential for medium- or long-term slight impacts on the setting of these heritage features, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs from the new line development (-2).

The HRA of the TDPNI has identified the potential for water quality and habitat deterioration impacts on two European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.18 North Sperrin Generation Substation – Project 18

North Sperrin Generation Substation – New Substation, Substation Extension, New Transmission Line and Underground Cables

It is proposed to install a new substation in the North Sperrins area (near Feeny) connecting a number of windfarms, connected to Magherafelt at 110 kV (using a mix of cable and overhead line, route TBD); and to extend Magherafelt substation and install a shunt reactor and 275/110 kV transformer. The wider study area and 50% least cost areas have been determined in GIS for this proposed installation.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – Within the study area there are eight SACs, namely Ballynahone Bog, Banagher Glen, Carn – Glenshane Pass, Curran Bog, Owenkillew River, River Faughan and Tributaries, River Roe and Tributaries and Teal Lough. Ballynahone bog is the only RAMSAR site located within the study area. Within the study area there are 17 ASSIs, namely Altmover Glen, Ballyknock, Ballynahone Bog, Banagher Glen, Carn/Glenshane Pass, Crockaghole Wood, Curran Bog, Drumbally Hill, Drumlea and Mullan Woods, Lough Lark, Owenkillew River, River Faughan and Tributaries, River Roe and Tributaries, Sruhanleanantawey Burn, Tamnyrankin, Teal Lough and Slaghtfreeden Bogs and Teal Lough Part II. There are two National Nature Reserves, Ballynahone Bog and Banagher Glen. In total, 79 SLNCIs are crossed by the study area. Additionally, there are 52 Salmonid Rivers and one Salmonid Lake, Fea Lough, contained within the study area. The Ballinderry Freshwater Pearl Mussel Catchment is located within the study area.

Population & Human Health - There are 23 main settlements within the study area (Ballyrory, Cranagh, Culnady, Curran, Dernaflaw, Desertmartin, Draperstown, Dungiven, Feeny, Foreglen, Glen (Magherafelt LGD), Gulladuff, Knockclogher, Longfield, Maghera (Magherafelt LGD), Magherafelt, Moneyneany, Park, Straidarranm Straw, Swatragh, Tobermore and Upperlands), with a mean population density of 10.8 people / km^2. There are areas of lower perceived health at Upperlands, Magherafelt and Davagh Road / Broughderg Road.

Geology, Soils & Land Use – The study area covers c. 825 km^2 and is composed of broadleaf woodland (5%), coniferous woodland (6%), arable land (1%), improved grassland (26%), semi-natural grassland

(33%), mountain heath and bog (28%) and suburban land (1%). Within the study area there are three ASSIs designated for geological features, namely Drumbally Hill, Drumlea and Mullan Woods, Sruhanleanantawey Burn. There are 242 ancient woodland areas (68 of which have been lost) and 33 Forest Services (Banagher, Davagh, Derrynoyd, Glenshane, Goles, Iniscarn, Learmount, and Moydamlaght) sites scattered throughout the area. Throughout the study area, 46 areas of unstable ground comprised of peat have been identified, as well as 11 upland areas, and two areas comprised of landslide deposits south-west of Desertmartin. Within the study area seven PPC sites and 841 historical sites that have the potential of being contaminated land have been identified. Additionally, there are 15 abandoned mines within the study area. There is one quarry within the study area, located off Quarry Road north of Knockloughrim.

Water – Within the study area there are 46 WFD Rivers, of which 29 have good ecological status, the remaining 4 are of less than good status with the majority (13) being of moderate ecological status. There are 2991 river segments within the study area. Within the study area there is one drinking water lake, Lough Fea, and three drinking water rivers, namely Lissan Water, Owenrigh River and White Water. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Maghera, Magherafelt, Dungiven, Curran, Tobermore, Daperstown, Straw and Claudy areas. There are areas with 0.5% AEP pluvial flood risk widespread across the study area; these areas are particularly concentrated in the east of the study area around Maghera, Tobermore, Desermartin, Swatragh and Magherafelt.

Air – There are two AQMAs within the study area, namely Dungiven AQMA and Magherafelt AQMA No1.

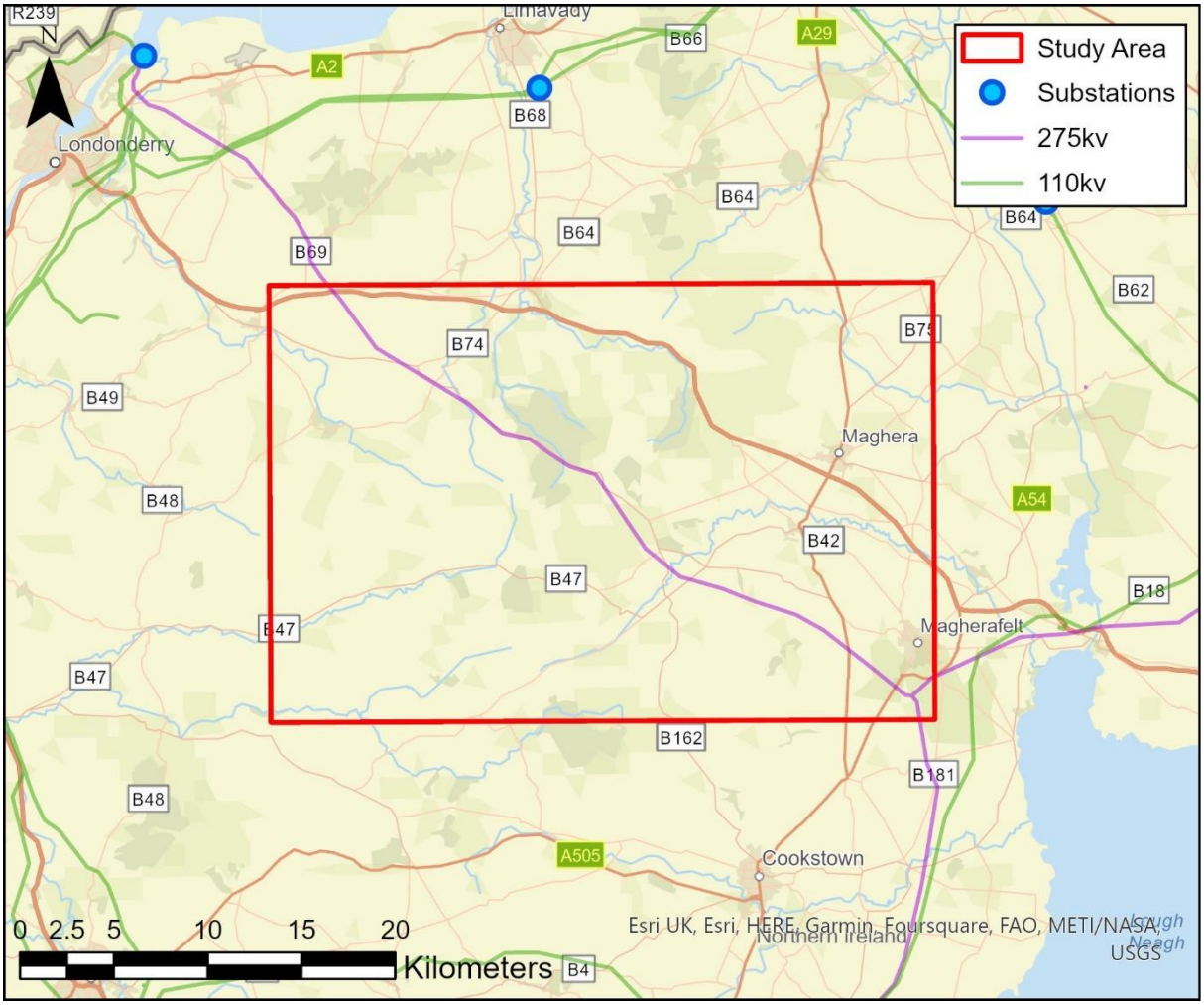
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Maghera, Magherafelt, Dungiven, Curran, Tobermore, Daperstown, Straw and Claudy areas. There are areas with 0.5% AEP climate change pluvial flood risk widespread across the study area; these areas are particularly concentrated in the east of the study area around Maghera, Tobermore, Desermartin, Swatragh and Magherafelt.

Material Assets – Within the study area there are 79 km of A roads, 127 km of B roads, 334 km of <4M tarred roads and 350 km of minor roads. There are eight 275 kV OHLs. Within the study area there is 397 km^2 of agricultural land, this is comprised of 4.4 km^2 of complex cultivation patterns, 15.57 km^2 of land principally occupied by agriculture and 377 km^2 of pastures.

Cultural, Architectural & Archaeological Heritage – Within the study area there are 650 SMRs and 91 Scheduled Zones (e.g., barrow, raths, court tombs). There are 280 Listed Buildings, 720 Industrial Heritage areas (e.g., bridges, gatehouses, tannery, corn mills), and 11 Defence Heritage areas within the study area. There are two Areas of Significant Archaeological Interest located around Greencastle / Dunnamore and nine Areas of Archaeological Potential within the study area (Culnady, Curran, Desertmartin, Dungiven, Feeny, Gulladuff, Maghera, Magherafelt and Tobermore). The study area contains five Parks and Gardens, namely Ampertaine House, Knockan and Ashpark, Learmount, Pellipar and Rockwood.

Landscape & Visual Amenity – Within the study area there are 15 LCAs, of which seven are of High sensitivity (Beaghmore Moors and Marsh, Glenelly Valley, Glenshane Slopes, South Sperrin, Sperrin Foothills, Sperrin Mountains and Lower Bann Valley), seven are of Medium sensitivity (Binevenagh, Garvagh Farmland, Magherafelt Farmland, Moyola Floodplain, Roe Basin, Slieve Gullion and Upper Moyola Valley), and one is of Low sensitivity (Loughermore Hills) to development. The Sperrin AONB is also contained within this area.

Study Area


R239
N
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A2
B66
A29
B68
Londonderry
Study Area
Substations
275kv
110kv
B64
B64
B64
B69
B62
B74
B75
B49
Maghera
B48
A54
B42
B47
B18
B47
Magherafelt
B47
B162
B181
B48
A505
Cookstown
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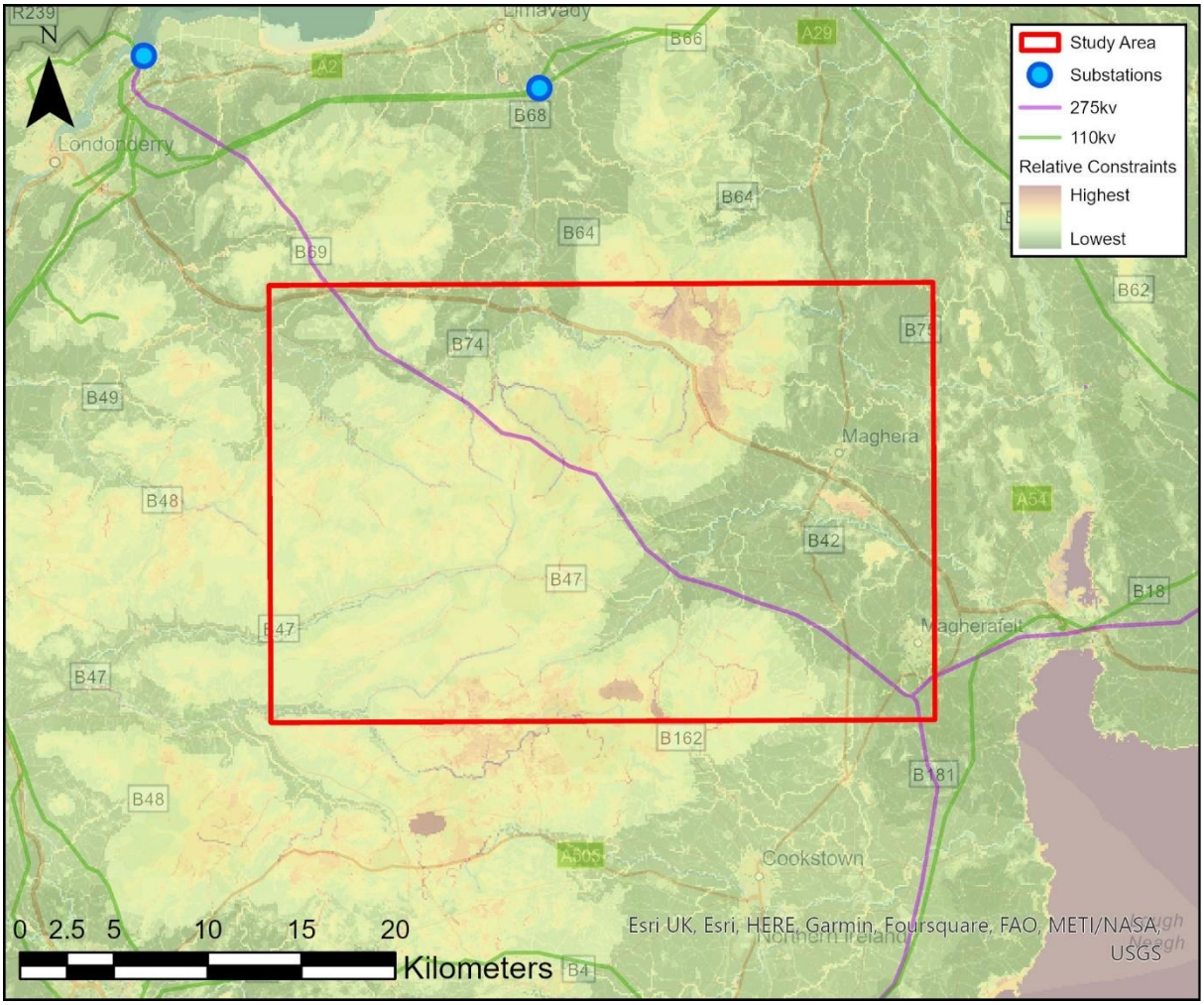
Northern Ireland

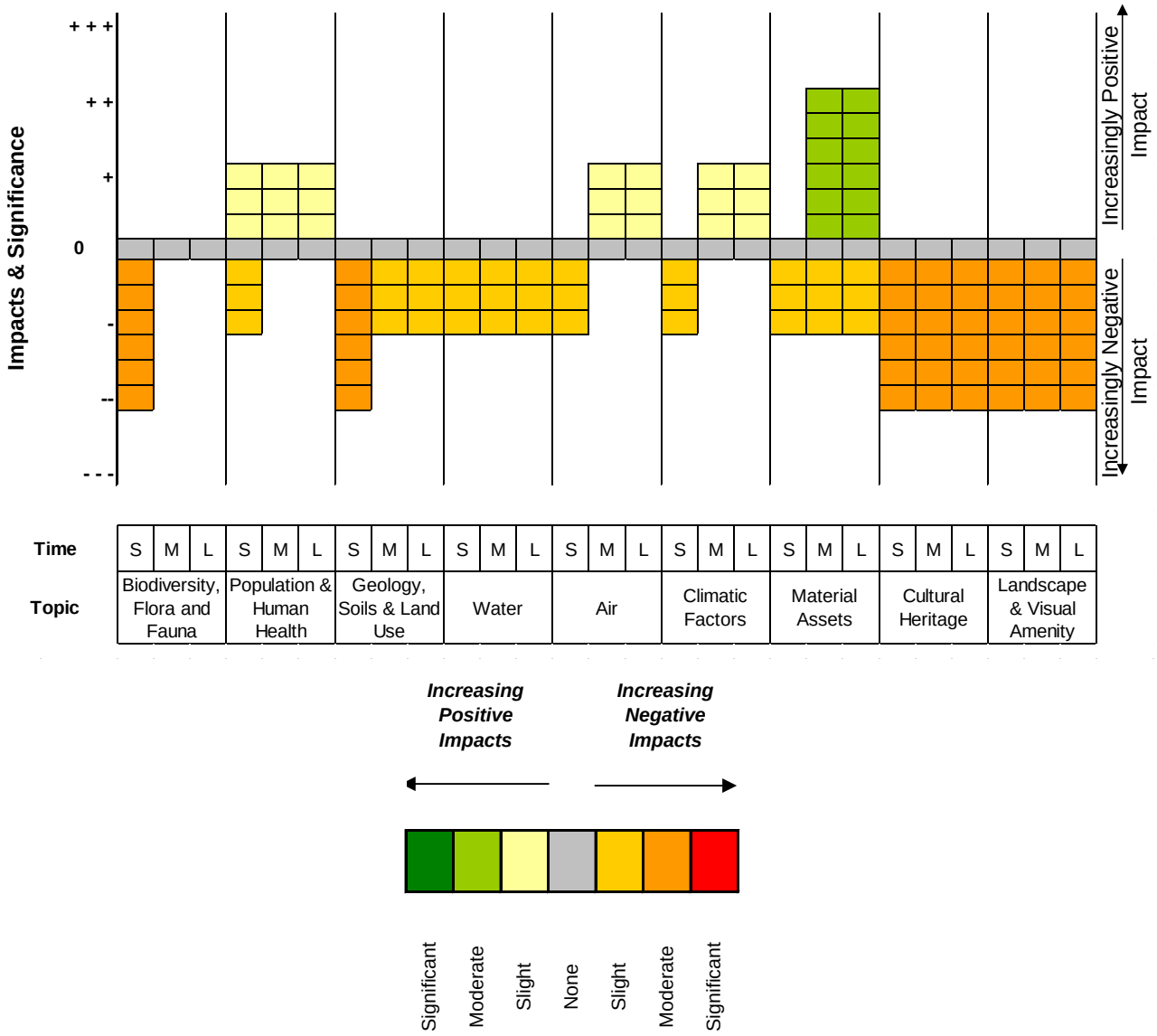
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	-1	-1
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-1	-1 / +2	-1 / +2
Cultural, Architectural & Archaeological Heritage (CH)	-2	-2	-2
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the North Sperrin Generation substation has the potential for short-term indirect, slight to moderate, negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national, and local designated sites. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for construction phase interaction with difficult topography and potentially contaminated sites (-2), and long-term, permanent, slight loss of soils and existing land uses in the footprint of the new substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); and potential for interaction with flood risk areas in the medium- or long-term (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate

change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, slight negative impacts on Material Assets owing to potential interactions with road, rail agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight to moderate positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+2). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight to moderate potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-2). There is the potential for short-term, construction phase, to long-term permanent, slight negative impacts on Landscape and Visual Amenity, including within sensitive LCAs and an AONB (-2).

The HRA of the TDPNI has identified the potential for habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts, on eight European Sites, from this project. The possibility of likely significant effects cannot be discounted on these sites at the plan-level assessment. Measures have been set out that are considered appropriate at plan level to avoid or reduce the harmful effects of the plan implementation on European sites; and take into account the safeguarding regime of project-level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI.

7.2.19 Cam Cluster – Project 19

Cam Cluster – New Substation

It is proposed to install a new cluster substation between Limavady and Coleraine (near Cam quarry). The wider study area and 50% least cost area have been determined in GIS.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There is one SLNCI located within the study area, River Roe SLNCI. Within the study area there are four Salmonid Rivers, namely Cam Burn, Castle River Tributary, Curly River and Macosquin River.

Population & Human Health - There are no main settlements within the study area. The mean population density of the study area is 0.2 people / km^2. Within the study area there are no Neighbourhood Renewal Areas, peace lines or areas of lower perceived health.

Geology, Soils & Land Use – The study area covers approximately 23.2 km^2 and is comprised of broadleaf woodland (3%), coniferous woodland (38%), improved grassland (16%), semi-natural grassland (7%), and mountain heath and bog (44%). Within the study area there are seven areas of Forest Service land (comprising Cam and Springwell sites). There are eight areas of unstable land comprising peat identified throughout the study area, and two upland areas. Within the study area there are four PPC sites and 14 historic land use areas that have the potential to be contaminated (predominantly mineral workings).

Water – Within the study area there are five WFD rivers, of which four have Good ecological status, namely Macosquin River (Macosquin), Shinney Water, Curly River and Castle River. The remaining river, Aghadowey River is of Moderate status. There are 101 river segments within the study area. One drinking water river runs through the study area, namely the Macosquin River. There are several regions with significant areas of 1% AEP fluvial flood risk within the study area, including the Ringsend, Letterloan and Springwell Forest areas. There are several areas with significant 0.5% AEP pluvial flood risk within the study area, including the Ringsend, Letterloan and Springwell Forest areas.

Air – There are no AQMAs or any other known air quality issues within the study area.

Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including the Ringsend, Letterloan and Springwell Forest areas. There are several

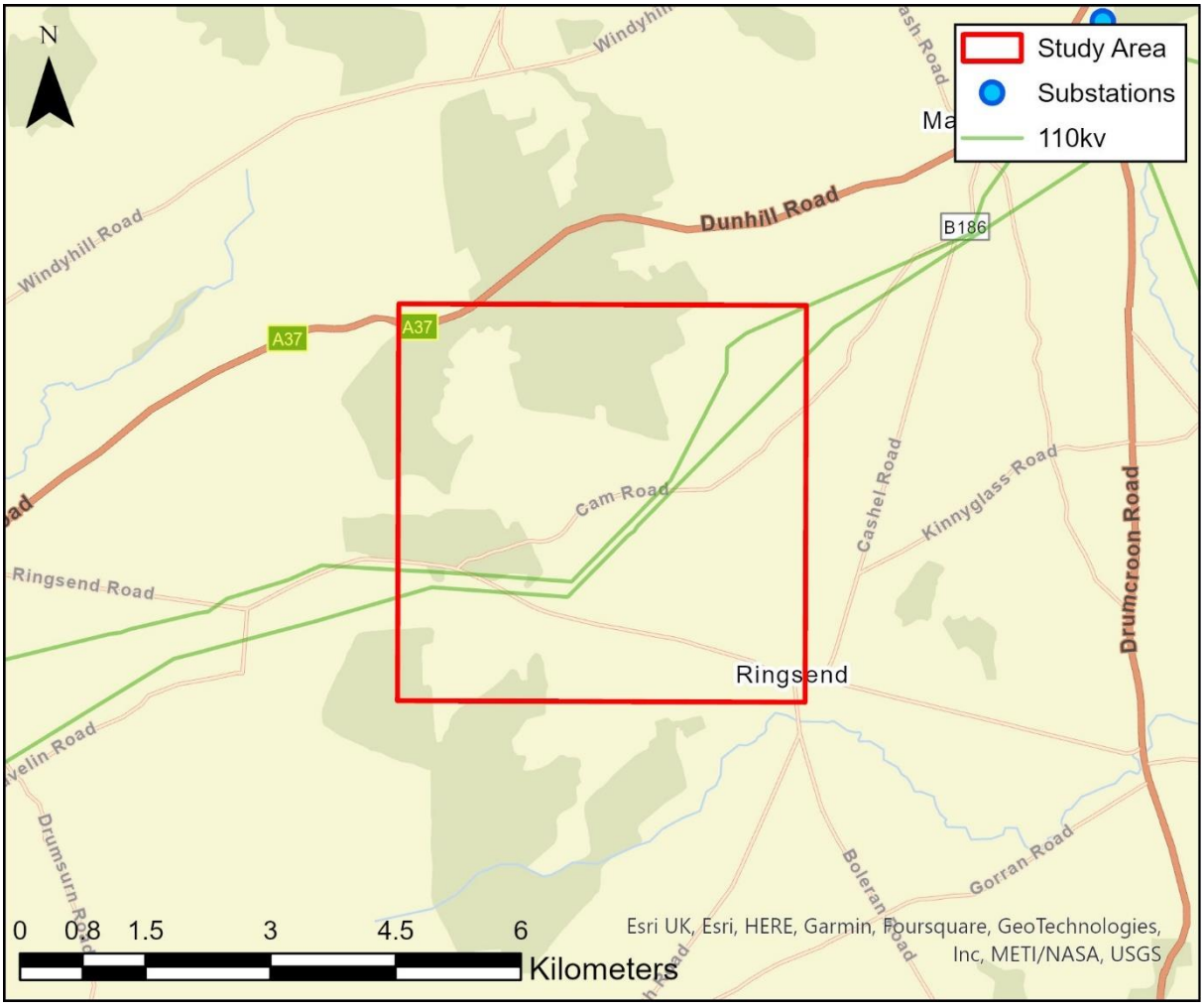
areas with significant 0.5% AEP climate change pluvial flood risk within the study area, including the Ringsend, Letterloan and Springwell Forest areas.

Material Assets – There are 1 km of A road, 5 km of B road and 8 km of minor road within the study area. There is also a gas transmission via the NW Pipeline, and two electrical transmission lines, all of which are 110 kV OHLs. Within the study area there is 5 km^2 of agricultural land, which is entirely comprised of pastures.

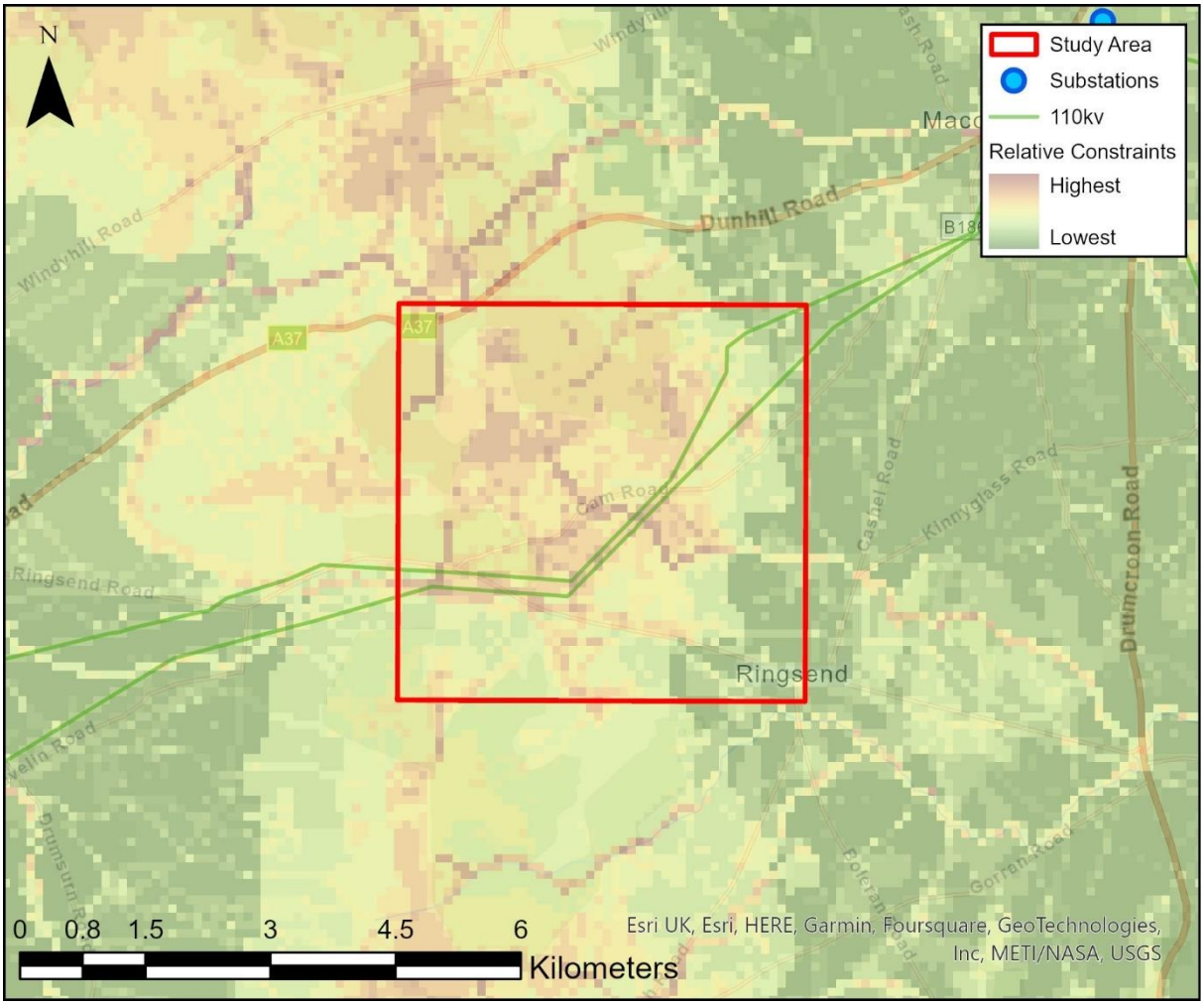
Cultural, Architectural & Archaeological Heritage – Within the study area there are eight SMRs (including graveyards, mass rocks, and standing stones), and one Scheduled Zone, which is a graveyard. The study area contains one Listed Building (69 Letterloan Road) and nine Industrial Heritage areas (e.g., bridges and historic mill sites and features).

Landscape & Visual Amenity – The study area intersects two LCAs, Binevenagh LCA and Eastern Binevenagh Slopes LCA, both of which are High / Medium sensitivity. There is also one AONB, Binevenagh.

Study Area



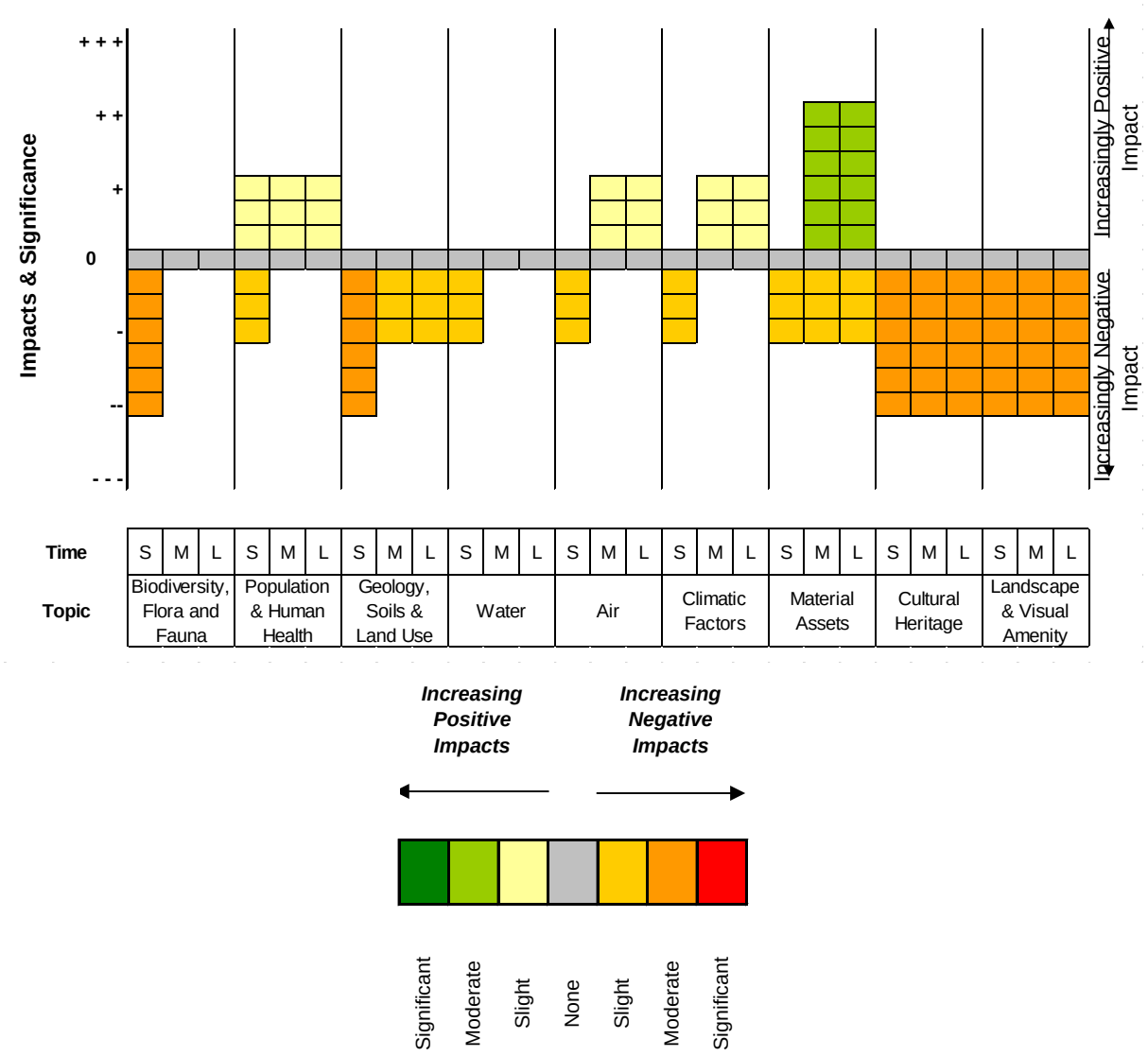
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	+1	+1
Climatic Factors (CF)	-1	+1	+1
Material Assets & Infrastructure (MA)	-1	-1 / +2	-1 / +2
Cultural, Architectural & Archaeological Heritage (CH)	-2	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Cam cluster substation has the potential for short-term construction phase, slight to moderate, indirect negative impacts (-2) on Biodiversity Flora and Fauna, including to international, national, and local designated sites and Salmonid Rivers. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and medium- to long-term, permanent loss of soils and existing land uses in the footprint of the new substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there is the potential for slight positive impacts on Air quality in the medium- to long-term owing to the potential for increased renewable energy

connectivity and associated reduction in air emissions associated with fossil fuels (+1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there is the potential for slight positive impacts on Climatic Factors in the medium- to long-term owing to the potential for increased renewable energy connectivity (+1). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight to moderate, direct or indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-2), and slight to moderate potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-2). There is the potential for short-term, construction phase, to long-term permanent, slight to moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs and adjacent to an AONB (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.2.20 Castlereagh 275 kV Redevelopment – Project 20

Castlereagh 275 kV Redevelopment – New Substation or Substation Extension

Refurbishment or offline replacement is proposed of the existing Castlereagh 275 kV substation on an adjacent site. The wider study area and 50% least cost area have been determined in GIS.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There is one SLNCI within the study area, namely Hillfoot Glen.

Population & Human Health - There are no main settlements within the study area, and the study area has a mean population density of 4.5 people / km^2. There are no perceived areas of lower health, peace lines or Neighbourhood Renewal Areas within the study area.

Geology, Soils & Land Use – The study area covers c. 0.8 km^2 and is composed of broadleaf woodland (17%), arable land (12%), improved grassland (50%), semi-natural grassland (3%), and mountain heath and bog (17%). There are three ancient woodland areas (Castlereagh), and one area of upland, located in the south of the study area.

Water – Within the study area there is one WFD River, the Connswater River which is of Poor ecological potential. There are two river segments within the study area (GBNI0500355 and UKGBNI0511604). There are four 1% AEP fluvial flood risk areas surrounding the Manse Road. There are several areas with 0.5% AEP pluvial flood risk located in surrounding the Manse Road, the Lisnabreeny Road, Lagan College and Bloomingdale Nurseries.

Air – There are no AQMAs or other known air quality issues within the study area.

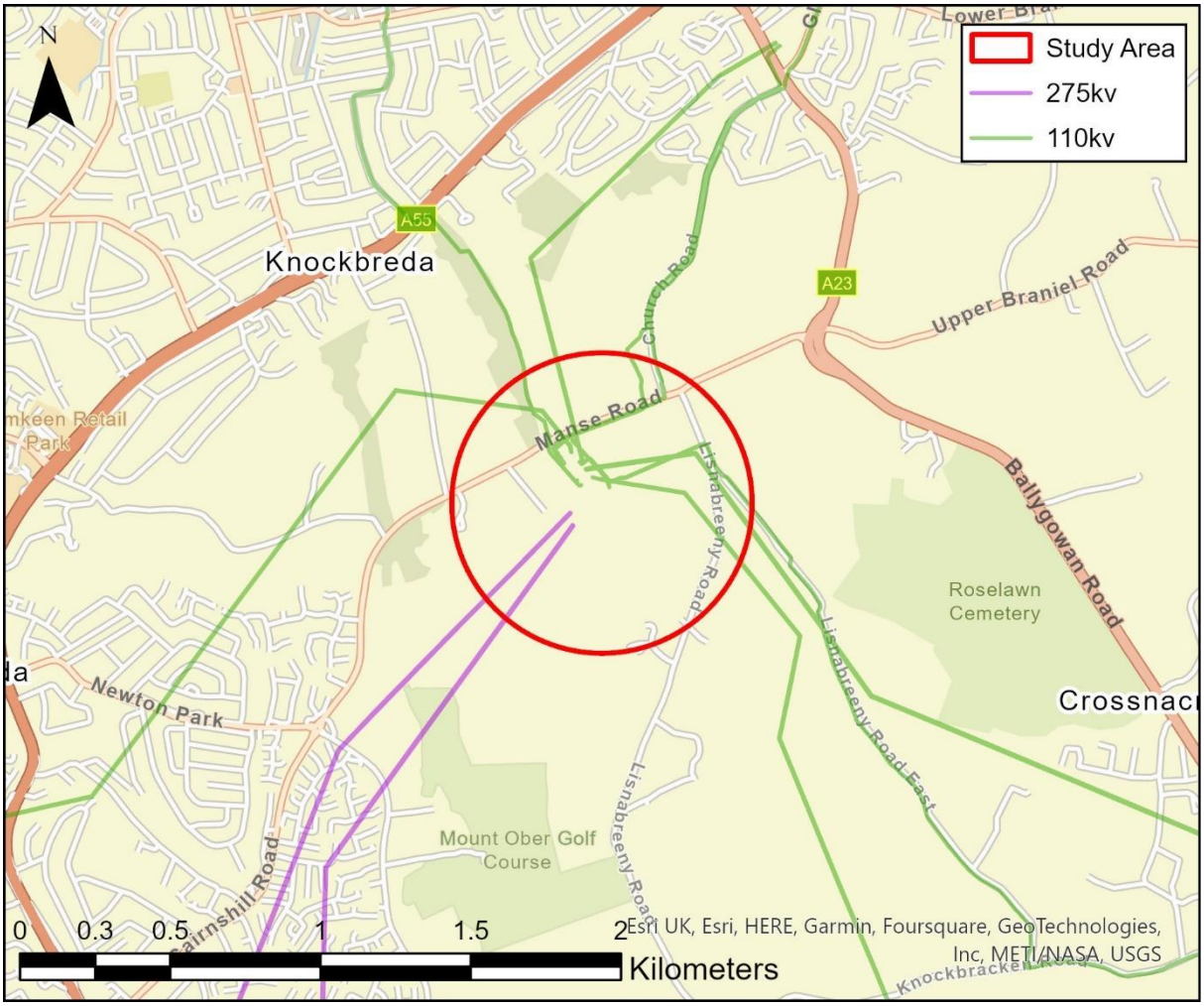
Climatic Factors – There are four 1% AEP climate change fluvial flood risk areas surrounding the Manse Road. There are several areas with 0.5% AEP climate change pluvial flood risk located in surrounding the Manse Road, the Lisnabreeny Road, Lagan College and Bloomingdale Nurseries.

Material Assets – Within the study area there are 2 km of minor roads and 0.19 km of <4M tarred roads. The study area contains 32 110 kV OHLs and four 275 kV OHLs. Within the study area there is 0.8 km^2 of agricultural land, which is comprised of 0.24 km^2 of complex cultivation patterns and 0.54 km^2 of pastures.

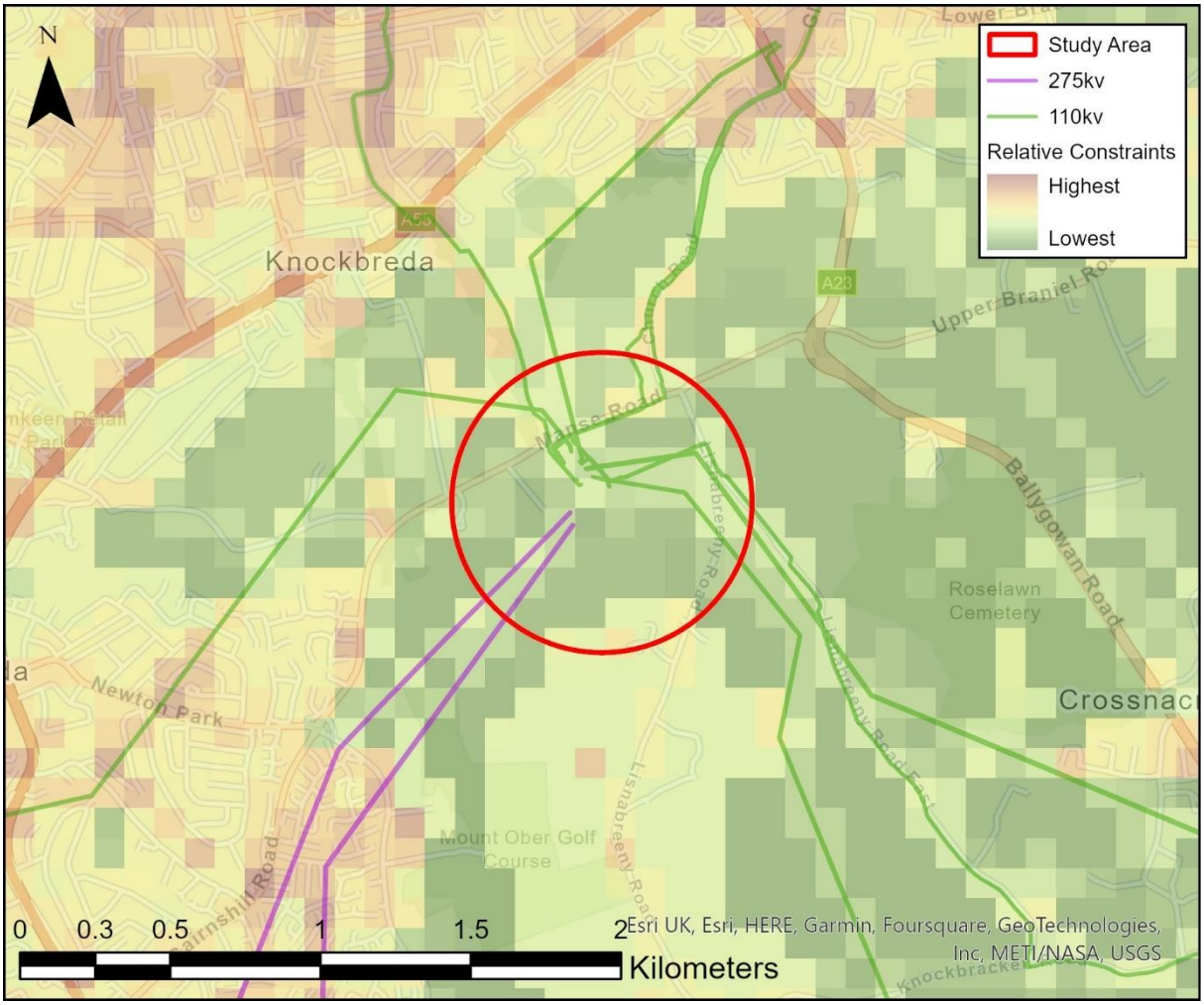
Cultural, Architectural & Archaeological Heritage – Within the study area there is one SMR (rath). There are three Listed Buildings (Charleville, Castlereagh Presbyterian Church and Leathem House), one Industrial Heritage area (windmill) and two Defence Heritage areas.

Landscape & Visual Amenity – Within the study area there are two LCAs, Castlereagh Slopes LCA and Castlereagh Plateau LCA, which are of High sensitivity and Medium sensitivity, respectively.

Study Area



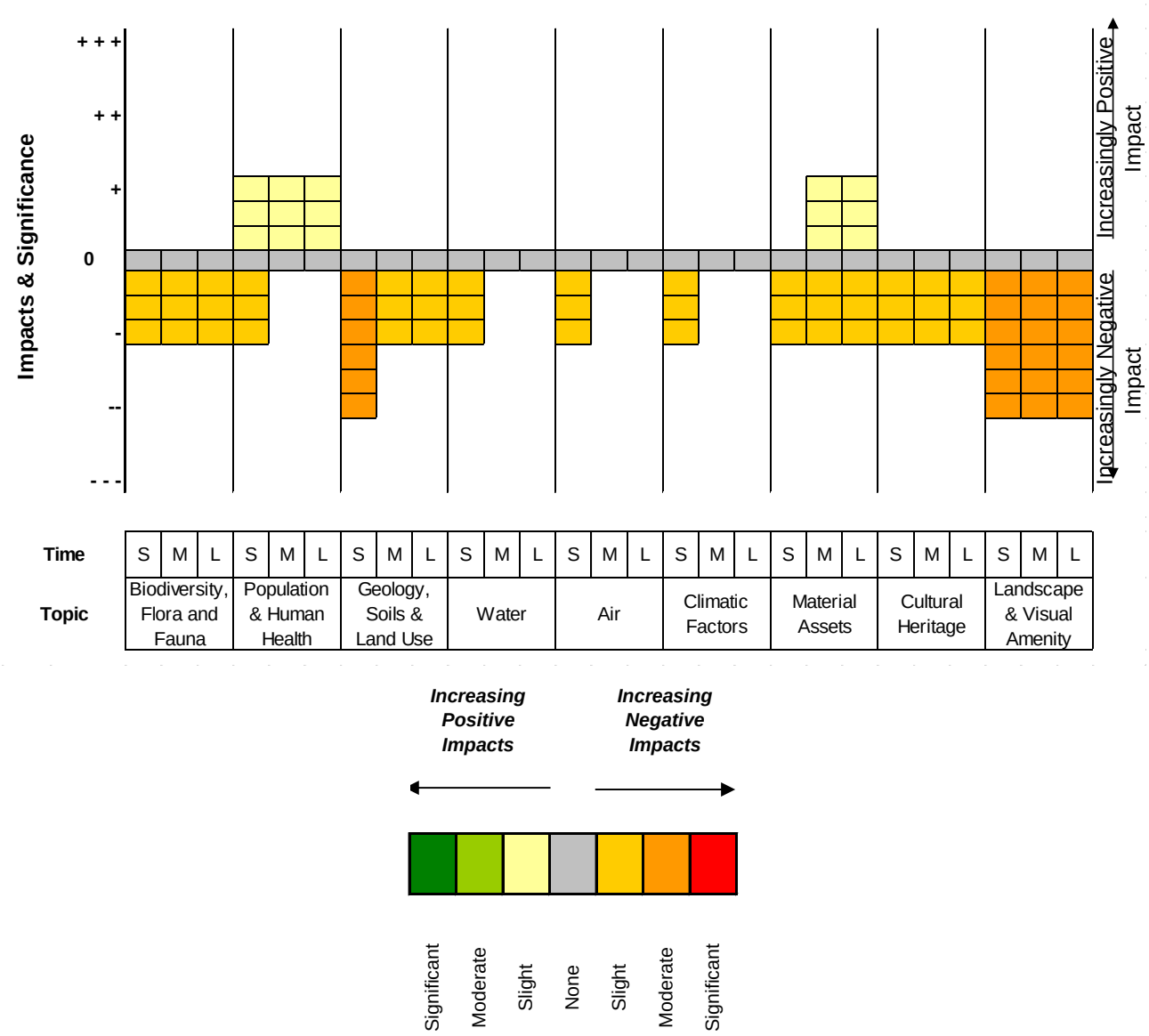
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-1	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	-1	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Castlereagh substation has the potential for short-term construction phase to long-term, slight negative impacts (-1) on Biodiversity Flora and Fauna, including to one locally designated site, however, this should be avoidable. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase,

in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.2.21 Coolkeeragh 275 kV Redevelopment – Project 21

Coolkeeragh 275 kV Redevelopment – New Substation or Substation Extension

Refurbishment or offline replacement is proposed of the existing Coolkeeragh 275 kV substation on an adjacent site. The wider study area (0.78 km^2) and 50% least cost areas have been determined in GIS.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There is one RAMSAR site, one SPA, and one ASSI, Lough Foyle, that intersects the very east part of the study area. There are no other habitat or biodiversity designations within the study area.

Population & Human Health - There are no main settlements within the study area. The mean population density of the study area is 0.21 people / km^2.

Geology, Soils & Land Use – The study area covers c. 0.8 km^2 and is composed of broadleaf woodland (27%), arable land (18%), semi-natural grassland (17%), mountain heath and bog (5%), coastal land (10%), urban land (21%) and saltwater (2%). Within the study area there are two PPC sites (Du Pont Maydown and Coolkeeragh ESB Ltd) and nine historical land use sites (e.g., chemical works, mineral workings and waste recycling) that have the potential of being contaminated land have been identified.

Water – There is one WFD transitional water body that intersects the study area, Foyle Harbour and Faughan, which is of Moderate ecological potential. There is one river segment intersected by the study area (UKGBNI9902836). There are two regions with significant areas of 1% AEP fluvial flood risk located in the north-east and north-west of the study area on the shore of Lough Foyle. Within the study area there is one significant area of 0.5% AEP coastal flood risk within the vicinity of the Lough Foyle shoreline. There are several areas with significant 0.5% AEP pluvial flood risk within the study area; these are located to the north and south of Electra Road, located on much of the existing infrastructure.

Air – There are no AQMAs or other known significant air quality issues within the study area.

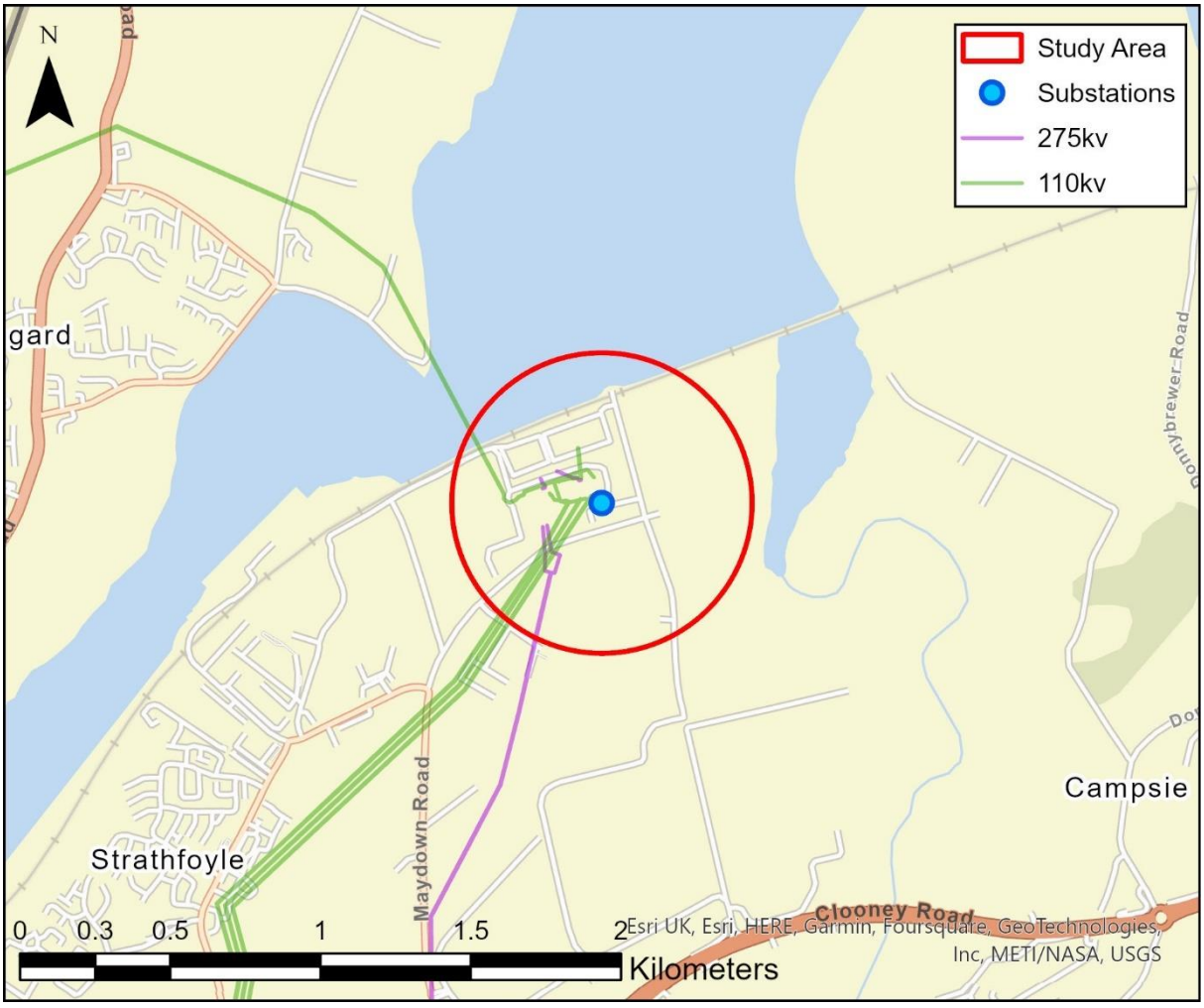
Climatic Factors – There are two regions with significant areas of 1% AEP climate change fluvial flood risk located in the north-east and north-west of the study area on the shore of Lough Foyle. Within the study area there is one significant area of 0.5% AEP climate change coastal flood risk within the vicinity of the Lough Foyle shoreline. There are several areas with significant 0.5% AEP climate change pluvial flood risk within the study area; these are located to the north and south of Electra Road, located on much of the existing infrastructure.

Material Assets – Within the study area there is 1 km of minor roads and 0.42 km of <4M tarred roads. There is approximately 760 m of railway that crosses the study area. Within the study area there is one gas transmission line (NW Pipeline), and 20 electricity transmission lines comprising fourteen 110 kV OHLs and six 275 kV OHLs. Within the study area there is 0.06 km^2 of agricultural land, which is entirely comprised of non-irrigated arable land.

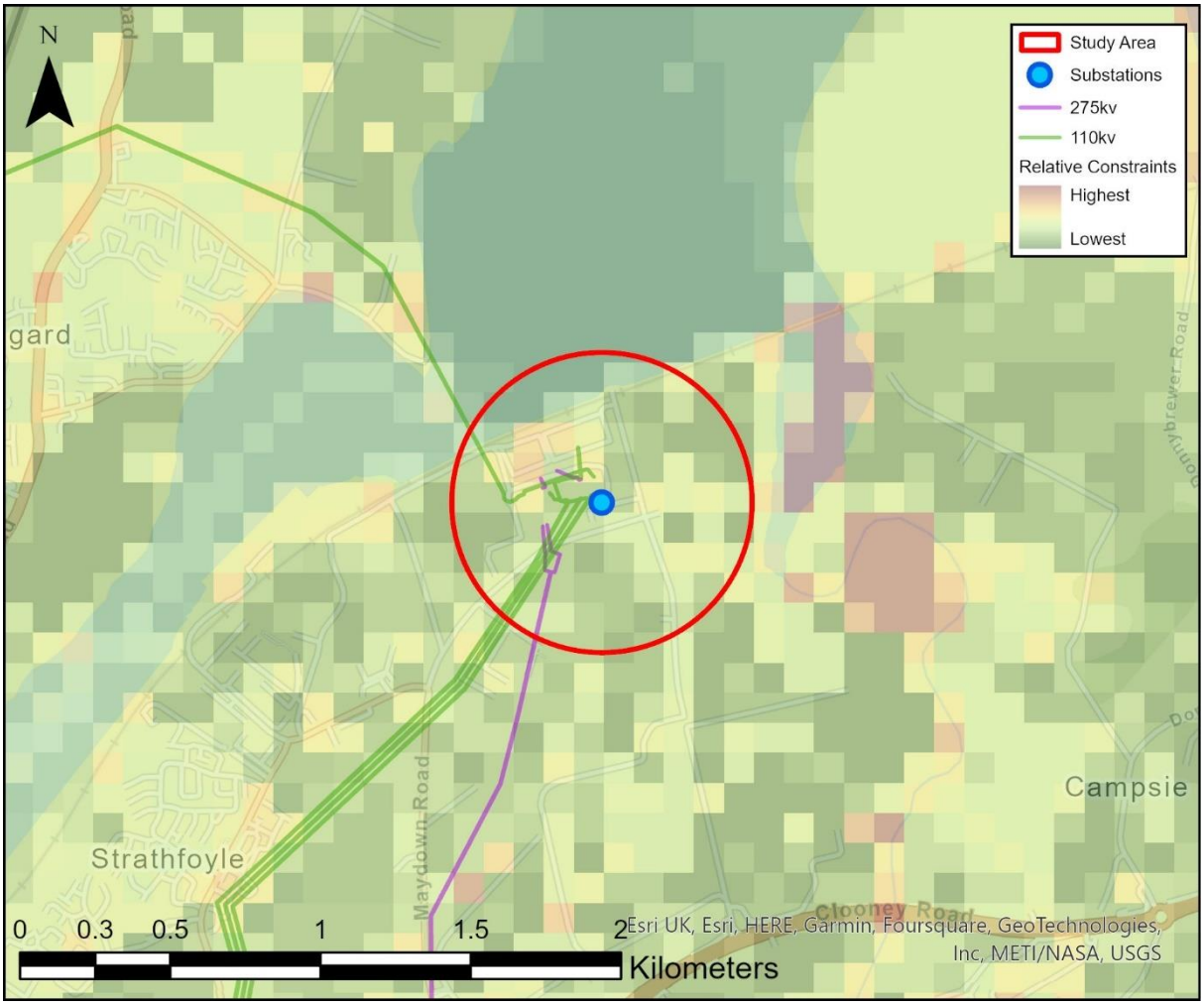
Cultural, Architectural & Archaeological Heritage – There are two Industrial Heritage areas (railway station and a lighthouse) and two Defence Heritage areas within the study area.

Landscape & Visual Amenity – Within the study area there is one LCA of Medium sensitivity namely, Lough Foyle Alluvial Plain LCA.

Study Area



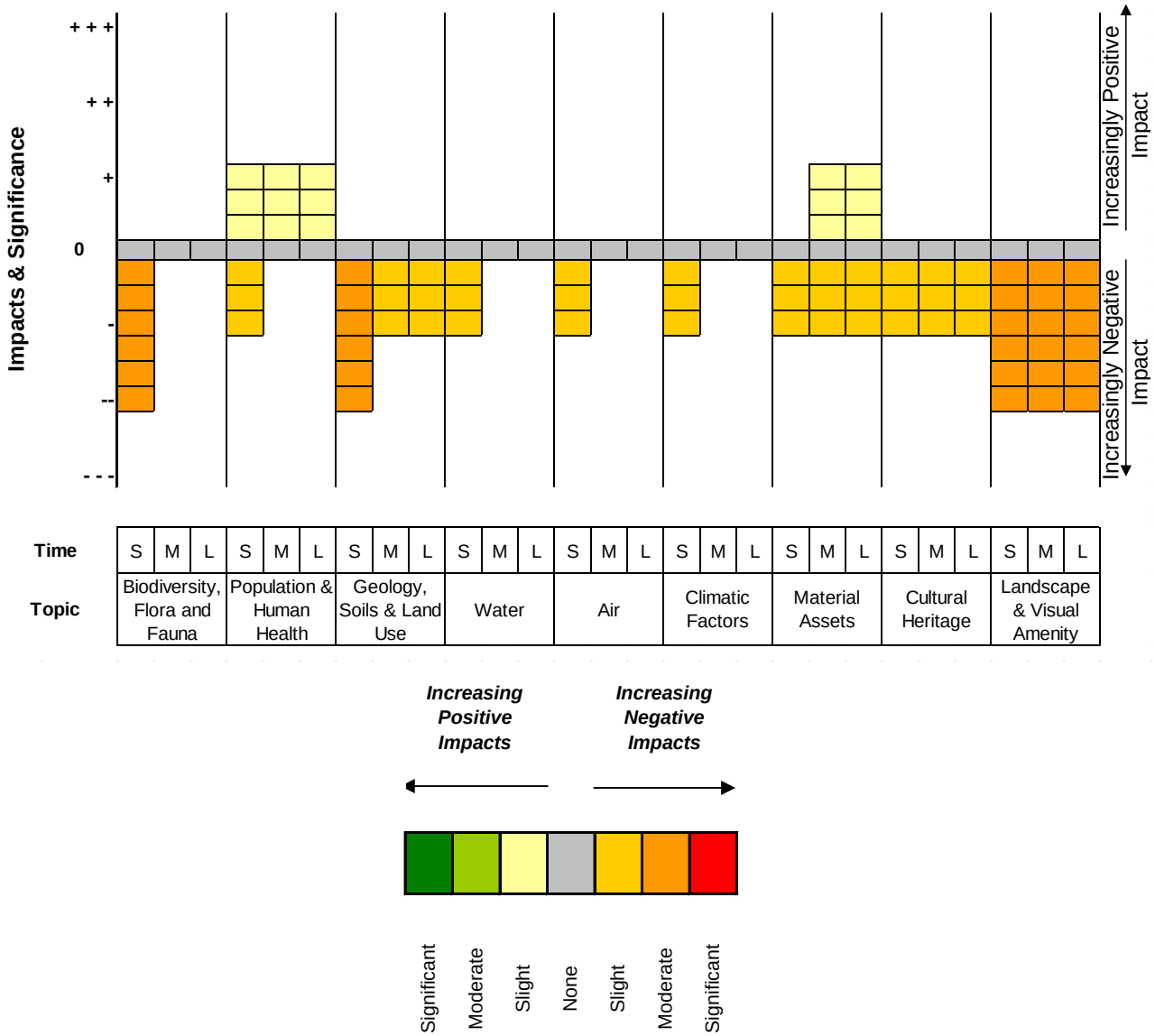
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-2	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	-1	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Coolkeeragh substation has the potential for short-term, temporary, construction phase, slight to moderate negative impacts (-2) on Biodiversity Flora and Fauna, including to international and national designated sites. There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-

sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.2.22 Kells 275 kV Redevelopment – Project 22

Kells 275 kV Redevelopment – New Substation or Substation Extension

Refurbishment or offline replacement is proposed of the existing Kells 275 kV substation on an adjacent site. The wider study area (0.78 km^2) and 50% least cost area have been determined in GIS.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There are no habitat or biodiversity designations within the study area.

Population & Human Health - There are no main settlements within the study area. The mean population density of the study area is 0.36 people / km^2.

Geology, Soils & Land Use – The study area covers c. 0.8 km^2 and is composed of broadleaf woodland (15%), semi-natural grassland (2%), mountain heath and bog (17%) and improved grassland (66%). One upland area has been identified in the east of the study area. There is one historical land use site, located at Kells Substation (power station), which has the potential of being contaminated land.

Water – There are two WFD rivers that run through the study area, Kells Water (Kells) and Connor Burn; both have Moderate ecological status. There are 11 river segments intersected by the study area. There several areas with 1% AEP fluvial flood risk located to the west of Maxwells Road and located at the existing substation between Maxwells Road and Doagh Road. There are several areas with 0.5% AEP pluvial flood risk throughout the study area, located at the existing substation and along water channels.

Air – There are no AQMAs or other known significant air quality issues within the study area.

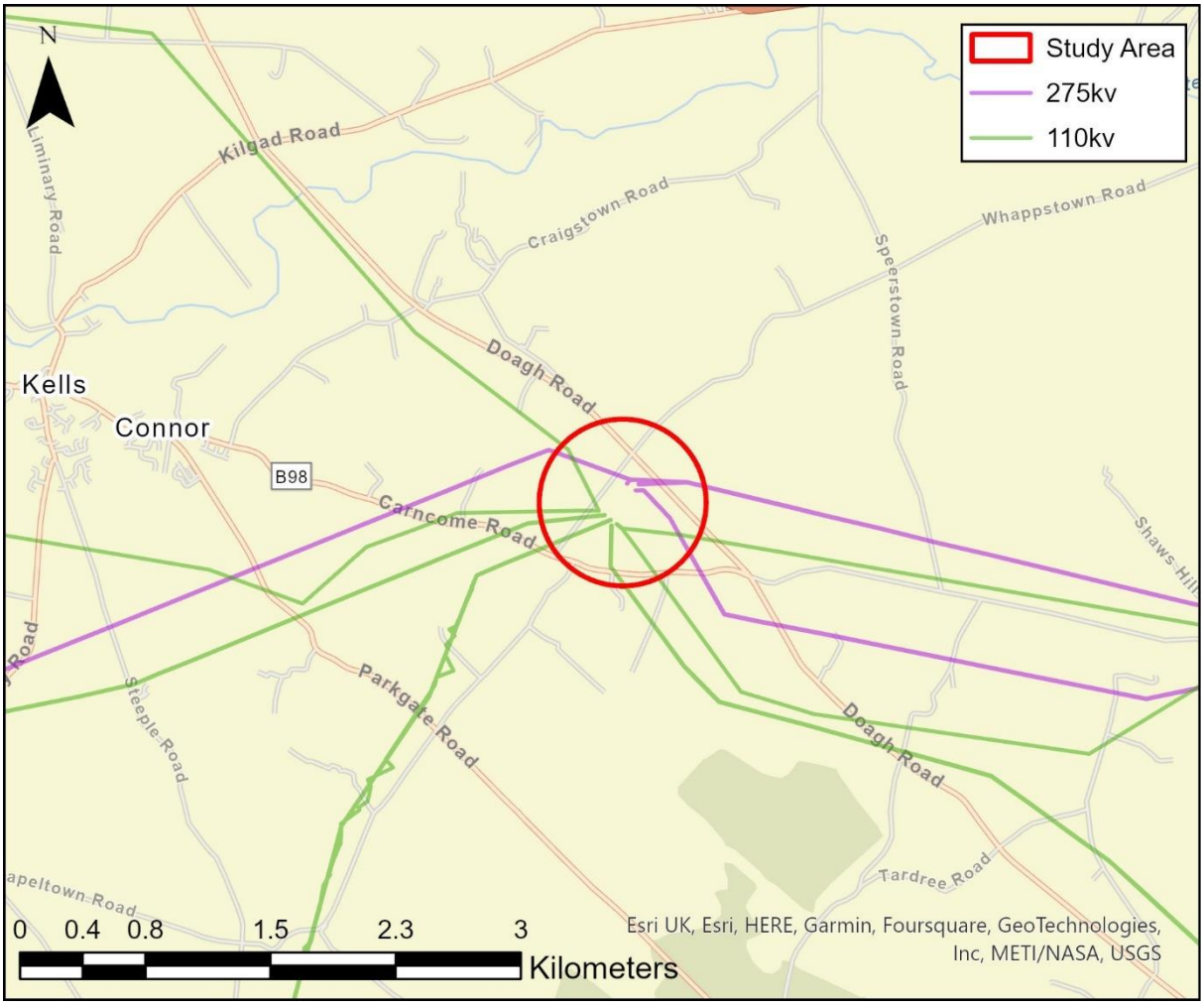
Climatic Factors – Within the study area there are several areas with 1% AEP climate change fluvial flood risk located to the west of Maxwells Road, and at the existing substation between Maxwells Road and Doagh Road. There are several areas with 0.5% AEP climate change pluvial flood risk throughout the study area, located at the existing substation and along water channels.

Material Assets – Within the study area there are 2 km of B Class roads and 1 km of minor roads. Within the study area there are 20 electricity transmission lines, including twelve 110 kV OHLs and eight 275 Kv OHLs. Within the study area there is 0.8 km^2 of agricultural land, which is entirely comprised of pastures.

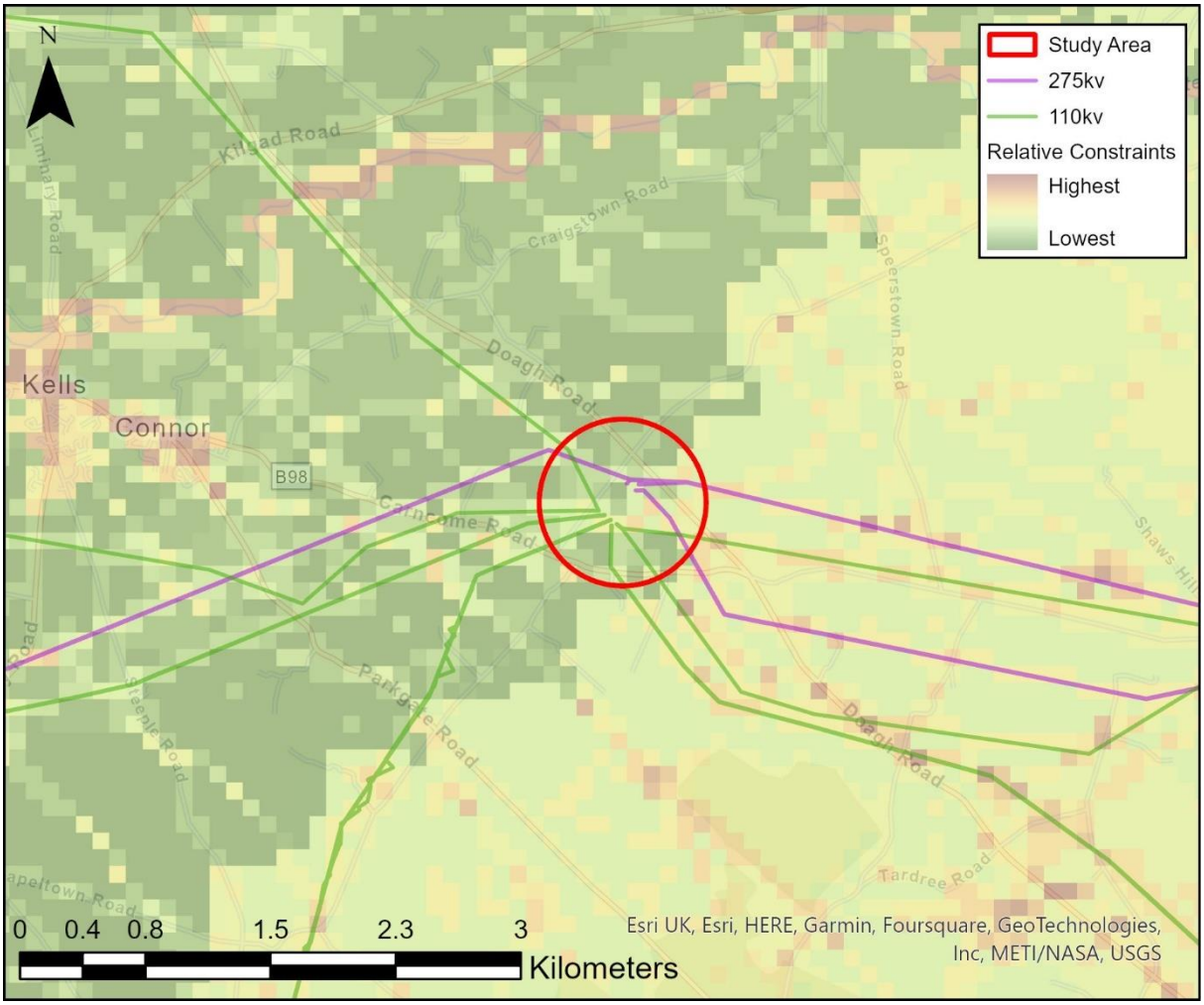
Cultural, Architectural & Archaeological Heritage – There is one SMR site (enclosure) within the study area.

Landscape & Visual Amenity – Within the study area there are two LCAs, Tardree and Six Mile Water Slopes LCA and Tardree Upland Pastures, which are of High and Low / Medium sensitivity to development, respectively.

Study Area



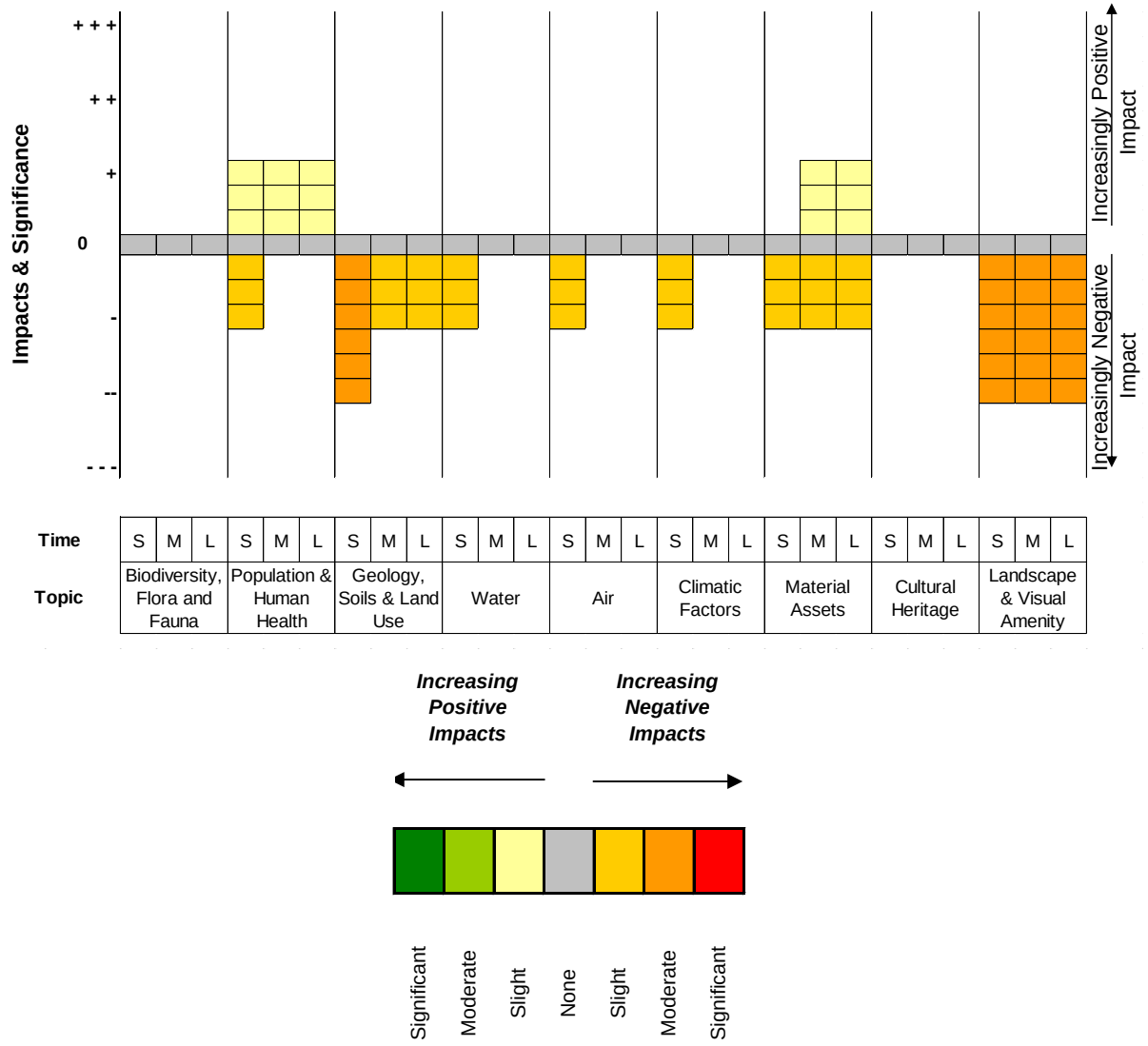
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	0	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	0	0	0
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Kells substation has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non-sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the OHL structures (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight

negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts on Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within a sensitive LCA (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.2.23 Magherafelt 275 kV Redevelopment – Project 23

Magherafelt 275 kV Redevelopment – New Substation or Substation Extension

Refurbishment or offline replacement is proposed of the existing Magherafelt 275 kV substation on an adjacent site. The wider study area (0.78 km^2) and 50% least cost area have been determined in GIS.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There is one Salmonid River that runs through the study area, namely Magherafelt Burn. There are no other habitat or biodiversity designations within the study area.

Population & Human Health - There are no main settlements within the study area. The mean population density of the study area is 0.49 people / km^2.

Geology, Soils & Land Use – The study area covers c. 0.8 km^2 and is composed of broadleaf woodland (6%), arable land (3%), semi-natural grassland (22%), mountain heath and bog (3%) and improved grassland (65%). There is one historical land use site, which is a former ceramics, cement and asphalt manufacturing facility located at the former substation, that has the potential of being contaminated land.

Water – One WFD River which has Moderate ecological potential runs through the study area, namely Magherafelt Burn. There are six river segments intersected by the study area. There are several regions with significant areas of 1% AEP fluvial flood risk, including land to the north of the existing substation, along Ballymoghan Drain to the north-east, and an unnamed drain to the north-west, as well as to the east and south of the existing substation along Gortagilly Drain. There are several areas with significant 0.5% AEP pluvial flood risk, including along an unnamed drain to the west of the existing substation, along Ballymoghan Drain to the north-east of the existing substation, the Gortagilly Drain to the east and south of the existing substation, and along the Thompsons Hill Drain to the east of the existing substation.

Air – There are no AQMAs or other known significant air quality issues within the study area.

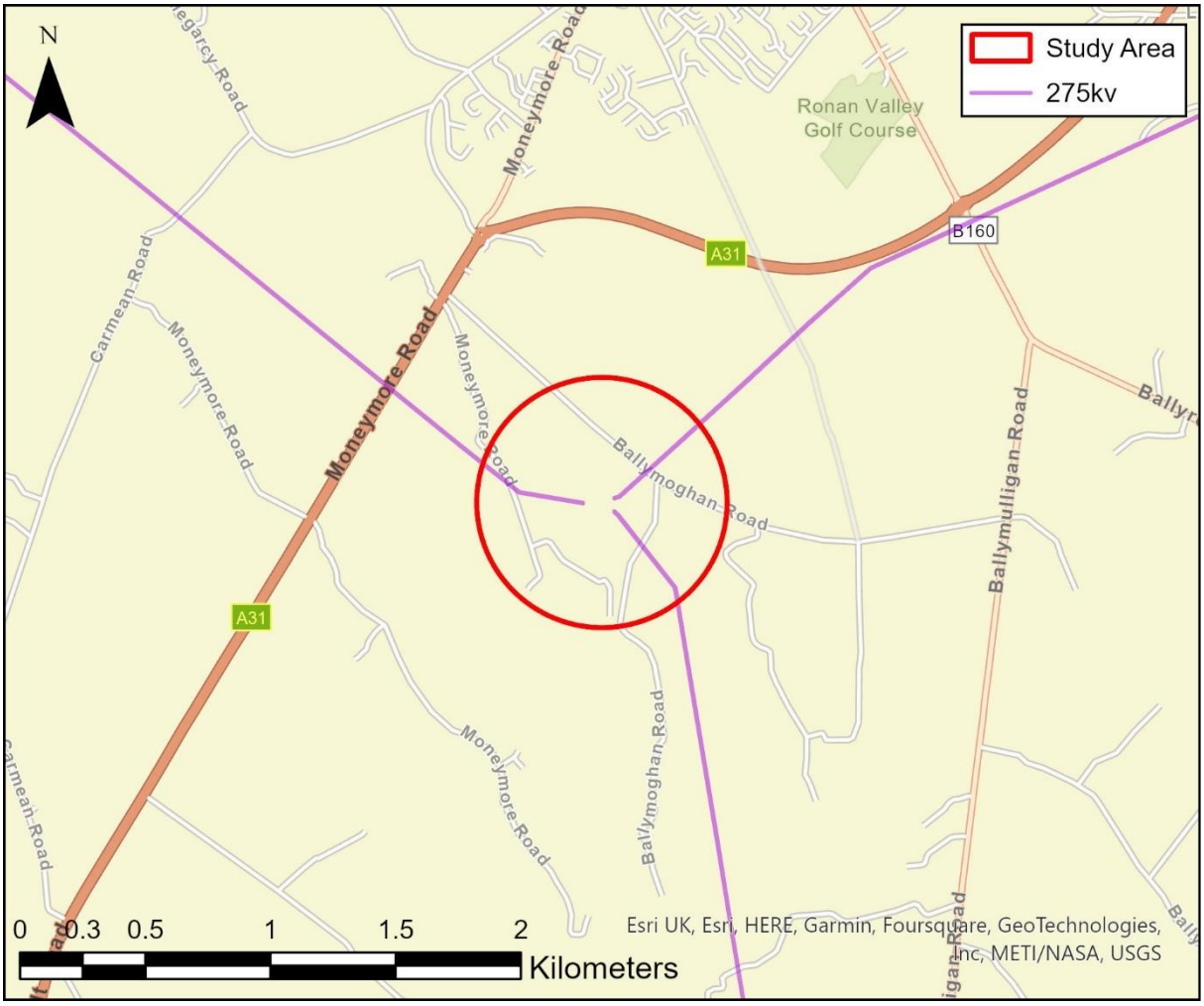
Climatic Factors – There are several regions with significant areas of 1% AEP climate change fluvial flood risk within the study area, including land to the north of the existing substation along Ballymoghan Drain to the north-east and an unnamed drain to the north-west, as well as to the east and south of the existing substation along Gortagilly Drain. There are several areas with significant 0.5% AEP climate change pluvial flood risk, including along an unnamed drain to the west of the existing substation, along Ballymoghan Drain to the north-east of the existing substation, the Gortagilly Drain to the east and south of the existing substation, and along the Thompsons Hill Drain to the east of the existing substation.

Material Assets – Within the study area there are 1 km of minor roads and 1 km of <4M tarred roads. Within the study area there are eight 275 kV OHLs. Within the study area there is 0.8 km^2 of agricultural land, which is comprised of 0.3 km^2 of non-irrigated arable land and 0.486 km^2 of pastures.

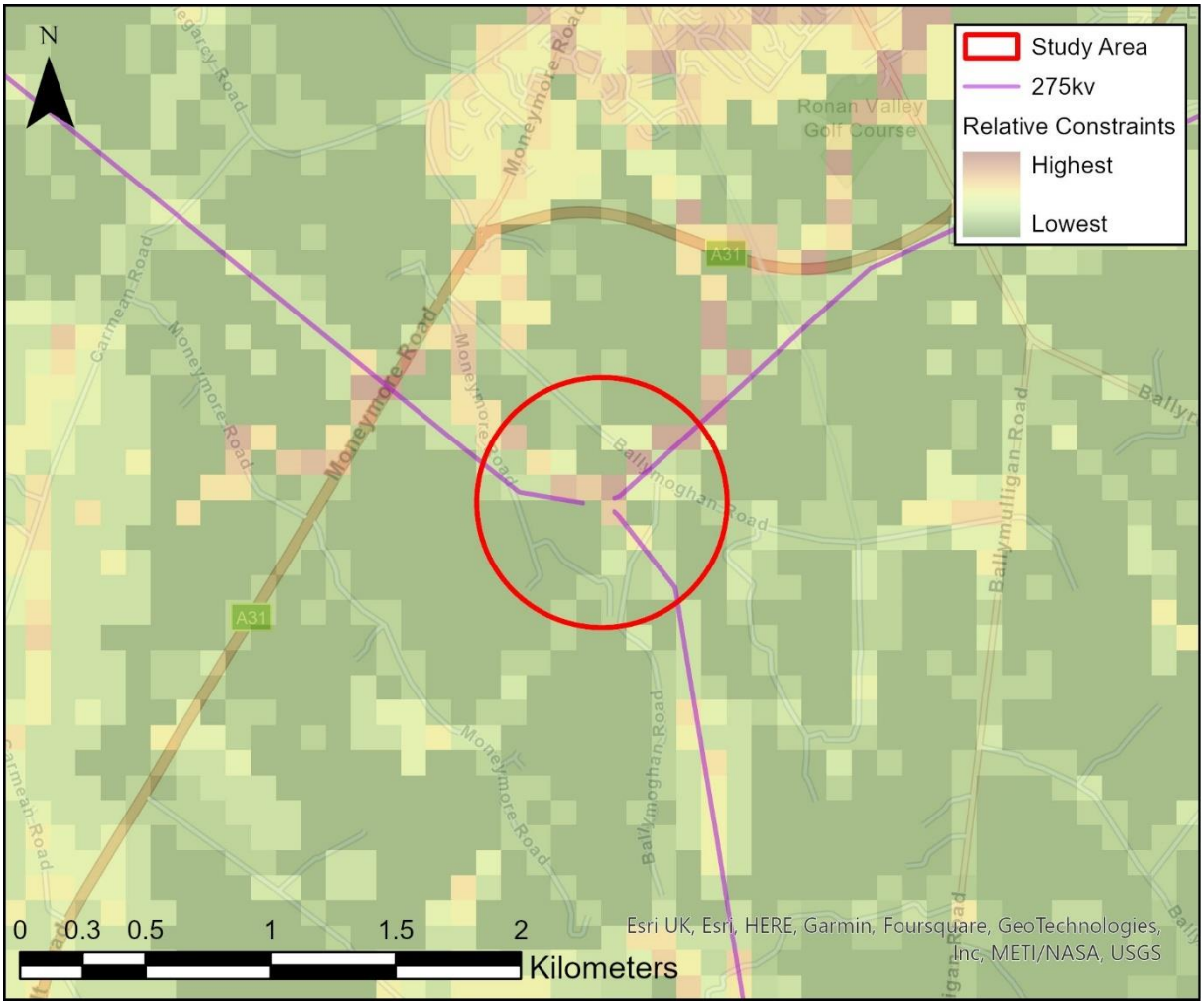
Cultural, Architectural & Archaeological Heritage – There is one SMR site (burial ground) and one Industrial Heritage area (limeworks) within the study area.

Landscape & Visual Amenity – The Magherafelt Farmland LCA is located within the study area; this LCA has a Medium / High sensitivity to development.

Study Area



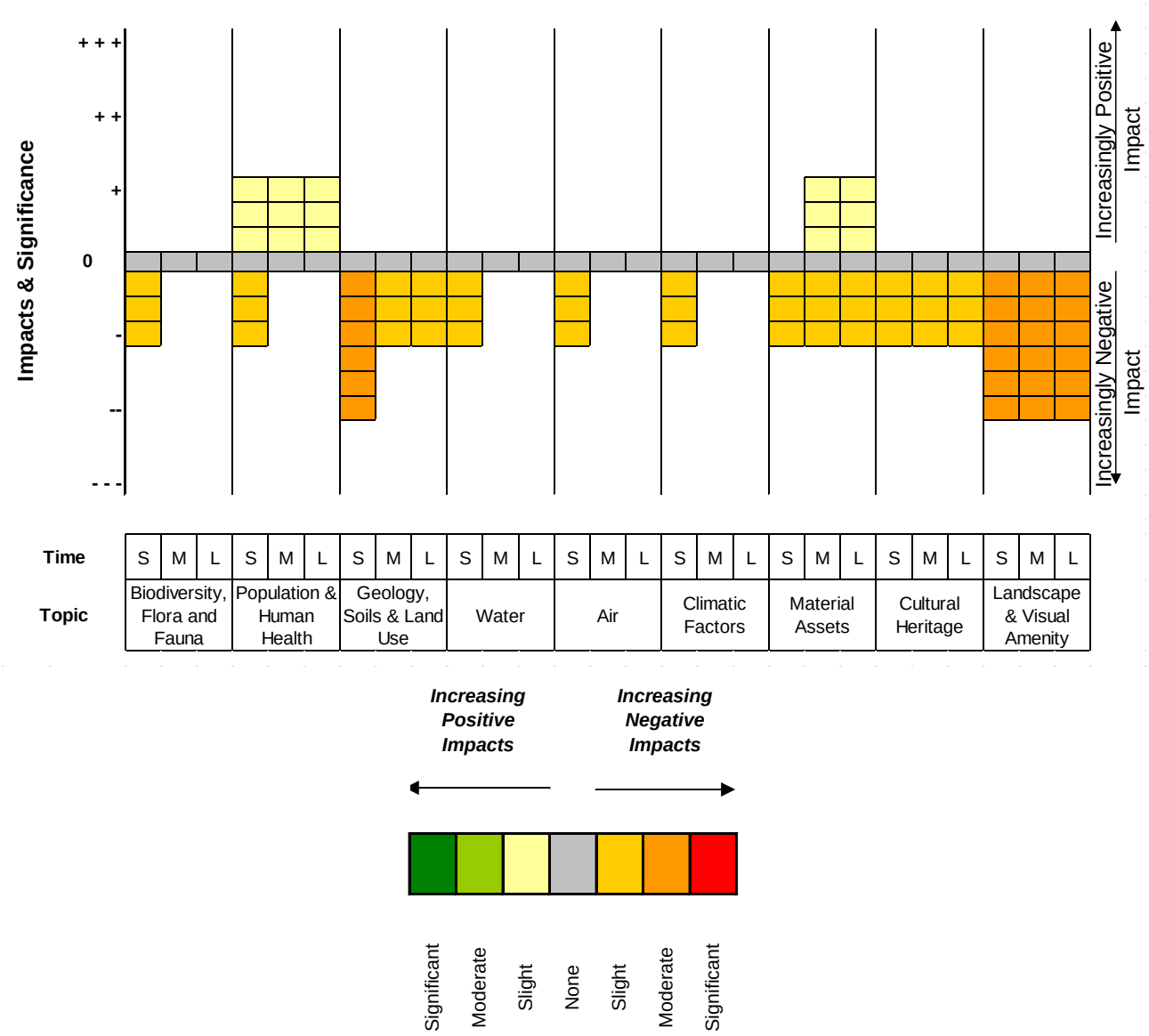
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	-1	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-1	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	-1	-1	-1
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Magherafelt substation has the potential for short-term, temporary, construction phase, slight negative impacts on Biodiversity Flora and Fauna, including to one Salmonid River (-1). There are unlikely to be any further medium- (0) or long-term (0) negative impacts to international, national or locally protected areas and species within the study area following these works. There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non -sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, in non-sensitive areas (-1); there are

unlikely to be any impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is the potential for short-term, temporary, construction phase, slight, indirect negative impacts on a number of Cultural Heritage features or their settings, during the construction works (-1), and slight potential for medium- or long-term impacts these heritage features, or their setting, within the study area, following these works (-1). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.2.24 Tandragee 275 kV Redevelopment – Project 24

Tandragee 275 kV Redevelopment – New Substation or Substation Extension

Refurbishment or offline replacement is proposed of the existing Tandragee 275 kV substation on an adjacent site. The wider study area (0.78 km^2) and 50% least cost area for this project have been determined in GIS.

Environmental Baseline and Key Issues within the Study Area

Environmental baseline information relevant to this study area is given below, ordered by SEA environmental topic. These sensitivities and indicators have the potential to be impacted by and impact upon the development and / or operation of transmission infrastructure.

Biodiversity, Flora & Fauna – There are no habitat or biodiversity designations within the study area.

Population & Human Health - There are no main settlements within the study area. The mean population density of the study area is 0.45 people / km^2.

Geology, Soils & Land Use – The study area covers c. 0.8 km^2 and is composed of broadleaf woodland (2%), arable land (17%), semi-natural grassland (42%), mountain heath and bog (8%) and improved grassland (31%). There are two historical land use sites located within the study area that have the potential of being contaminated land (road vehicle fuelling, service and repair: garages and filling stations).

Water – There are two WFD Rivers within the study area, Annagh River and Cusher River (Tandragee) which are of Bad and Moderate WFD status, respectively. Four river segments are contained within the study area (GBNI0304936, GBNI0304966, UKGBNI0308224, UKGBNI0308220). There is one region with significant area of 1% AEP fluvial flood risk surrounding the Ballymore Extension Drain which intersects the east of the study area. There are several areas with significant 0.5% AEP pluvial flood risk within the study area, surrounding the Portadown Road, Ballyknock Road, Mullahead Road and the Ballymore Extension Drain.

Air – There is one AQMA within the study area, namely Armagh City, Banbridge and Craigavon Borough Council AQMA.

Climatic Factors – There is one region with a significant area of 1% AEP climate change fluvial flood risk surrounding the Ballymore Extension Drain that intersects the east of the study area. There are several areas with significant 0.5% AEP climate change pluvial flood risk, surrounding the Portadown Road, Ballyknock Road, Mullahead Road and the Ballymore Extension Drain.

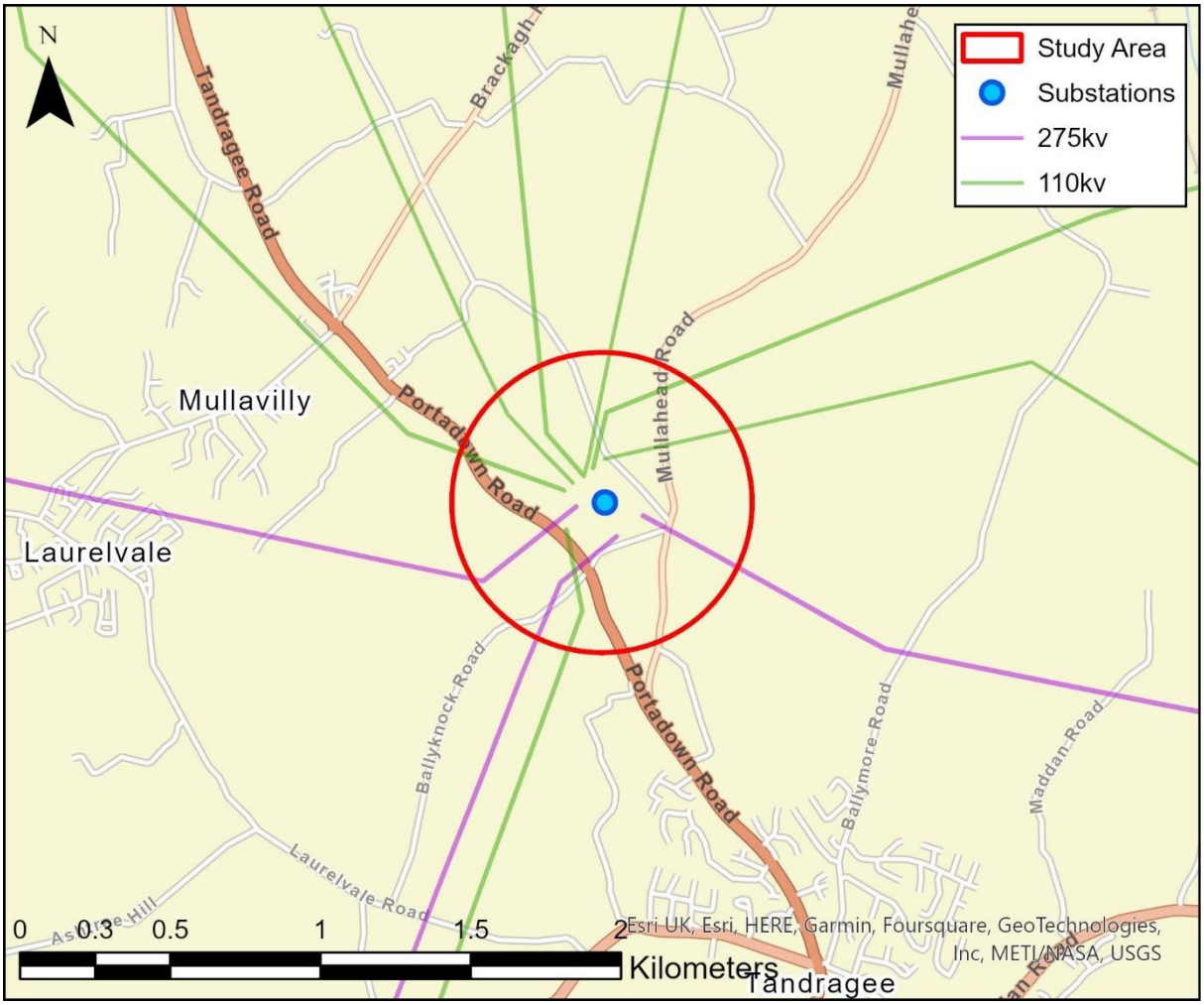
Material Assets – Within the study area there are 1 km of A road, 1 km of B roads, 1 km of <4M tarred roads and 1 km of minor roads. Within the study area there are 17 electricity transmission lines, six of which

are 275 kV OHLs, and 11 of which are 110 kV OHLs. There is total of 0.785 km^2 of agricultural land, comprised of 0.299 km^2 of non-irrigated arable land and 0.486 km^2 of pastures.

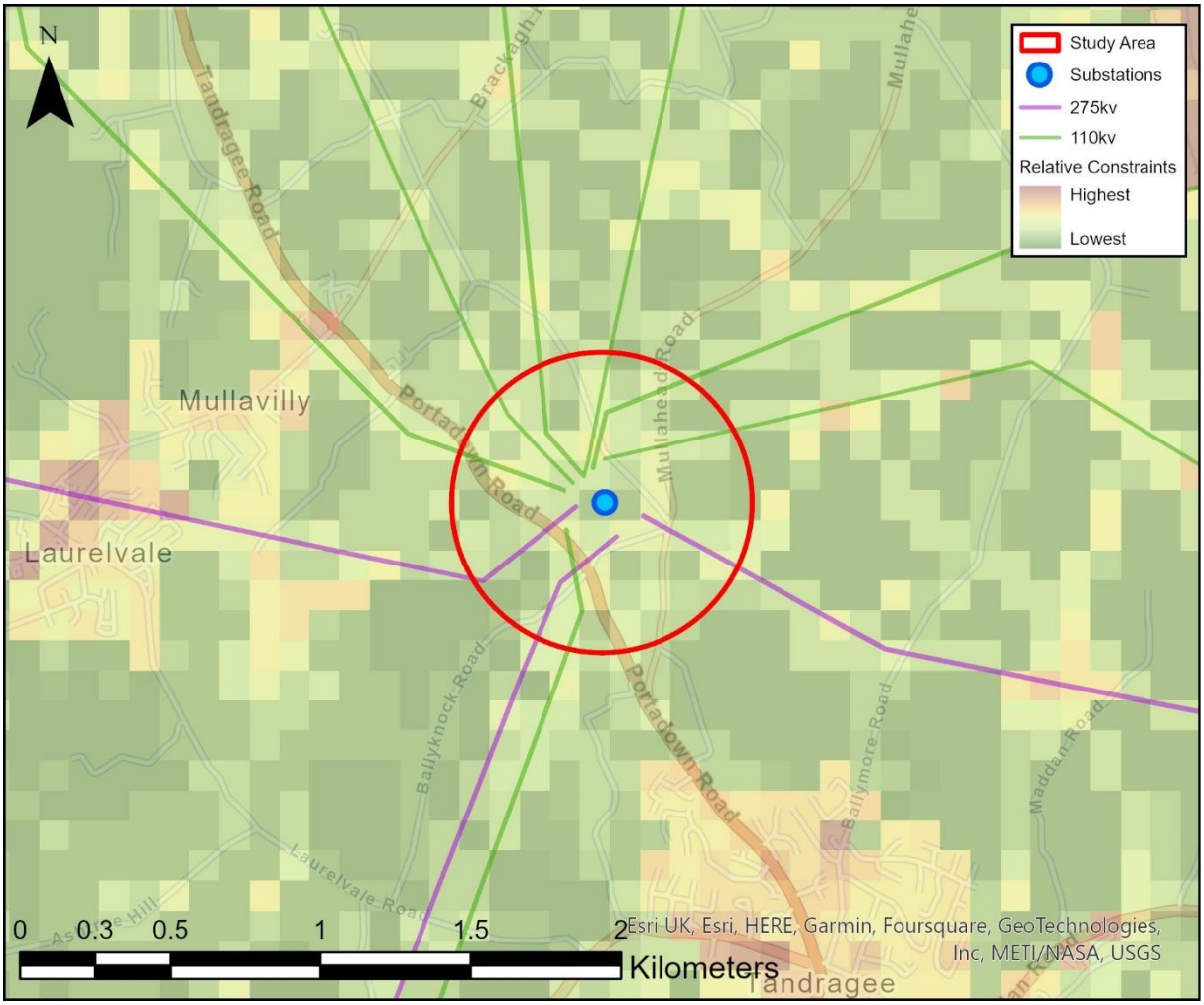
Cultural, Architectural & Archaeological Heritage – There is one Defence Heritage record area, located at the existing substation.

Landscape & Visual Amenity – There are two LCAs within the study area, namely the Upper Bann Floodplain LCA and the Loughgall Orchard Belt LCA, these are of High and Medium sensitivity to development, respectively.

Study Area



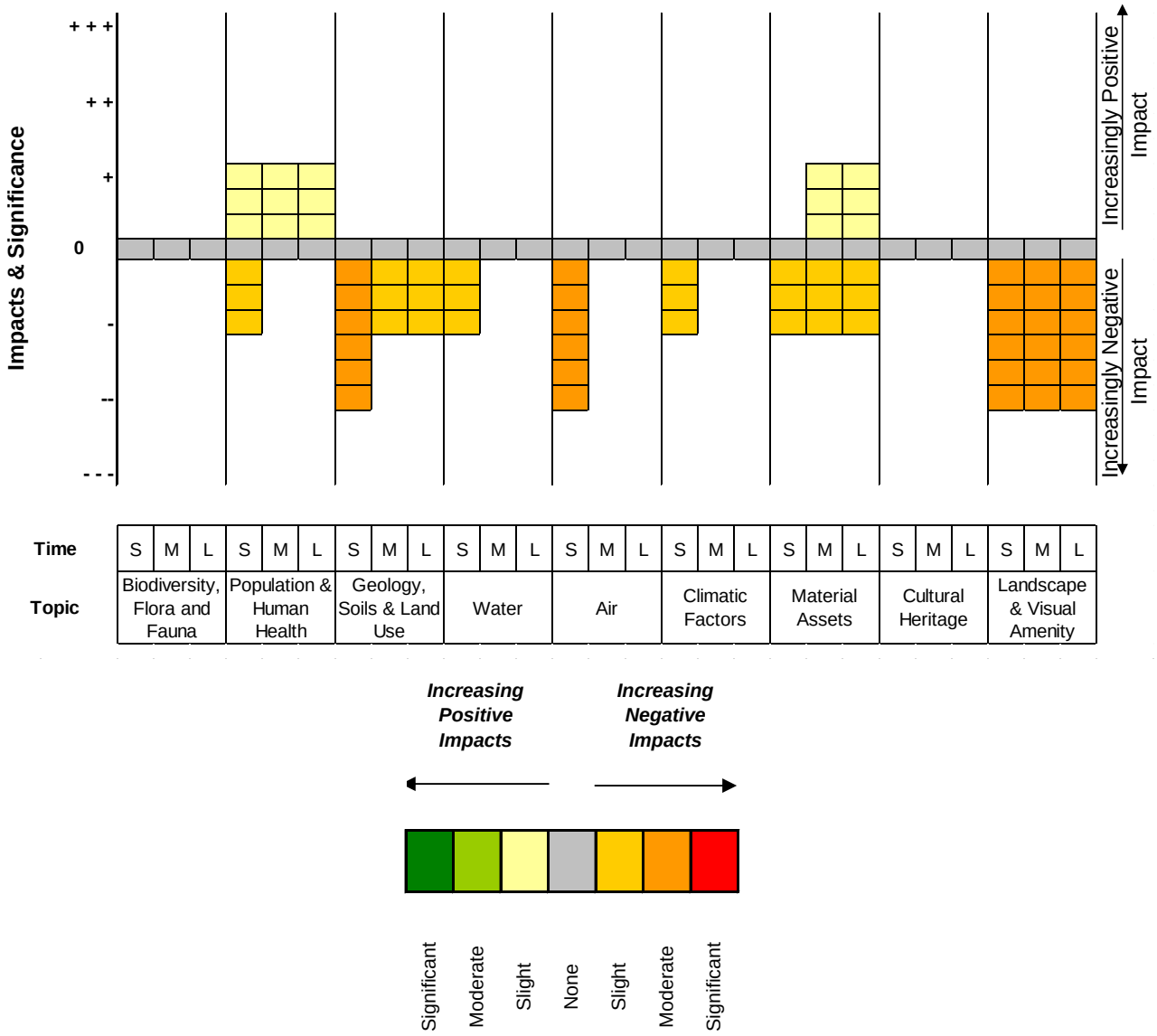
Constraints Model



Environmental Assessment

Environmental Topic	Short-Term Effects	Medium-Term Effects	Long-Term Effects
Biodiversity, Flora & Fauna (BFF)	0	0	0
Population & Human Health (PHH)	-1 / +1	+1	+1
Geology, Soils and Land Use (GSL)	-2	-1	-1
Water (W)	-1	0	0
Air (A)	-2	0	0
Climatic Factors (CF)	-1	0	0
Material Assets & Infrastructure (MA)	-1	-1 / +1	-1 / +1
Cultural, Architectural & Archaeological Heritage (CH)	0	0	0
Landscape & Visual Amenity (L)	-2	-2	-2

Summary Chart of Potential Effects



Key Conclusions:

Development of the Tandragee substation has the potential for short-term, temporary, construction phase, slight negative impacts on local Biodiversity Flora and Fauna. There are unlikely to be any short-, medium-, or long-term negative impacts to international, national or locally protected areas and species within the study area following these works (0). There is the potential for short-term, temporary, construction phase, slight negative disturbance impacts on Population and Human Health in non -sensitive areas (-1); there is the potential for slight positive impacts on Population and Human Health in the medium- and long-term owing to slight improvements to the existing transmission infrastructure (+1) and short- to long-term employment opportunities from construction and operation of the substation (+1). There is the potential for short-term, construction phase, slight to moderate negative effects on Geology, Soils and Land use, including potential construction phase interaction with sensitive soils and land uses (-2), and for medium-, and long-term, slight negative effects on Geology, Soils and Land use, including permanent loss of soils and existing land uses in the footprint of the substation (-1). There is the potential for short-term, temporary, construction phase, slight negative impacts on Water during the construction phase (-1); there are unlikely to be any impacts on Water status, resource or significant interaction with flood risk areas in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Air during the construction phase, including within sensitive areas (-2); there are unlikely to be any

impacts on Air quality in the medium- or long-term (0). There is the potential for short-term, temporary, construction phase, slight negative impacts on Climatic Factors during the works from construction-related GHG emissions and interaction with climate change flood extents (-1); there are unlikely to be any impacts on Climatic Factors in the medium- or long-term (0). There is the potential for short-term, construction phase, to long-term permanent slight negative impacts on Material Assets owing to potential interactions with road, agricultural land, and existing transmission infrastructure (-1); in the medium- and long-term there is potential for slight positive impacts from the development of reinforced electricity infrastructure within the study area following these works (+1). There is unlikely to be any potential for short-term, medium-, or long-term impacts Cultural Heritage features or their settings, as there are no known features within the study area (0). There is the potential for short-term, construction phase, to long-term permanent, moderate negative impacts on Landscape and Visual Amenity, including within sensitive LCAs (-2).

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

7.3 Cumulative / In-Combination Development Effects

Several of the projects within the TDPNI 2023-2032 are mutually exclusive and therefore will not be developed if other projects go ahead, i.e., they serve the same purpose so both would not be required. Some independent projects may, however, come together within the same geographical location and thus have more potential for in-combination or cumulative impacts. As these projects can be developed independently, there is limited potential for significant positive in-combination or cumulative impacts. This section looks at the projects that may be developed within the Plan period, within the same vicinity, therefore giving the potential for cumulative and / or in-combination impacts.

The tables below and **Figure 7-1** demonstrate the identified areas where independent projects could interact at construction stage and / or in the long-term operational stage, and where there is the greater potential for in-combination and / or cumulative negative impacts, which would need to be taken into consideration at the detailed planning and design stages.

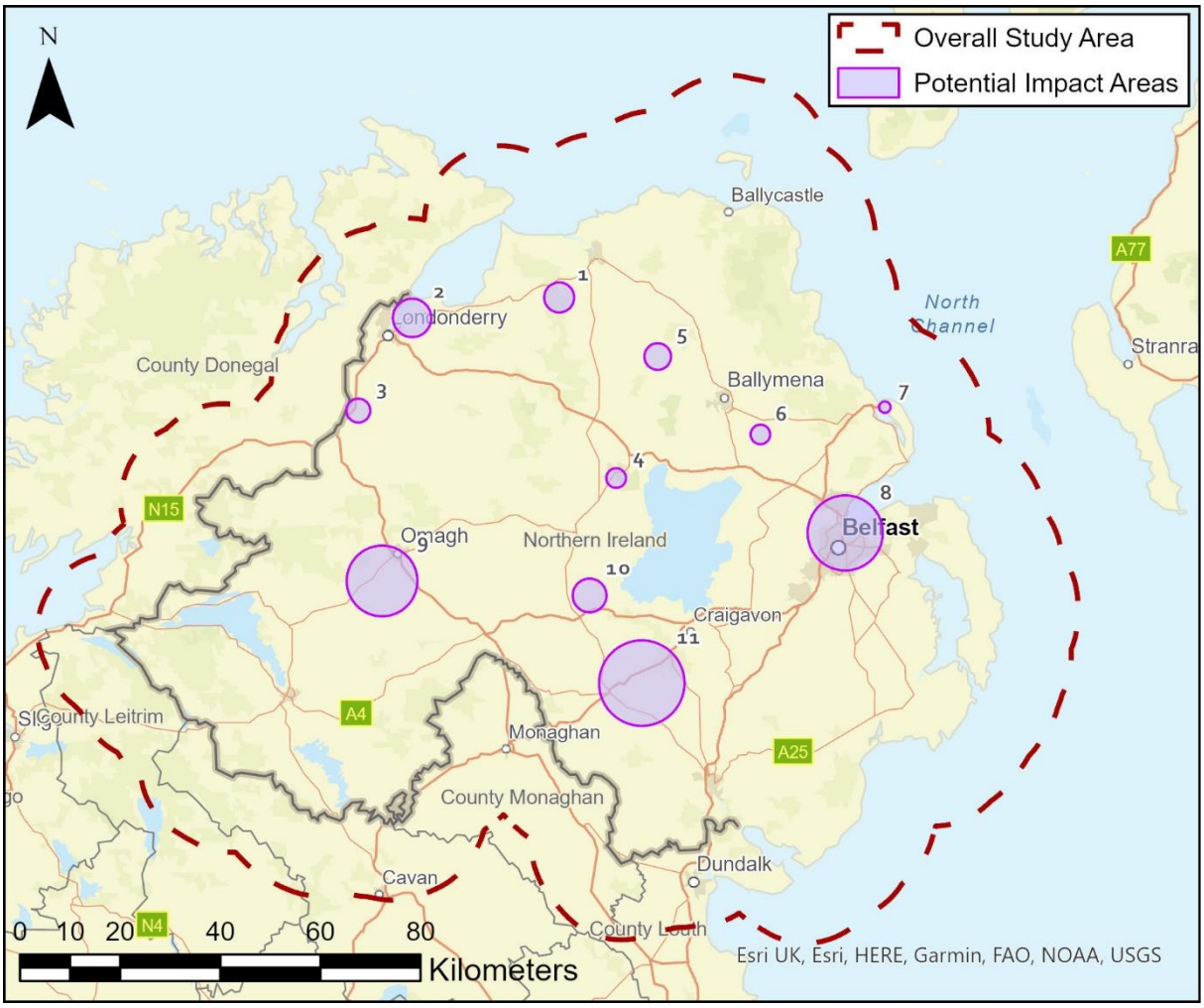


Figure 7-1 Potential Areas of In-Combination and Cumulative Impacts Between TDPNI Projects

1 - Cam Area; 2 - Coolkeeragh Area; 3 – Strabane Area; 4 – Magherafelt Area; 5 – Rasharkin Area; 6 – Kells Area; 7 – Moyle Area; 8 – Greater Belfast Area; 9 – Omagh Area; 10 – East Tyrone Area; 11 – Armagh / Tandragee Area.

7.3.1 Cam Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if any of the combinations of projects detailed in **Table 7-2** take place and works begin in the Cam area simultaneously.

For the three projects grouped as 'Potential Interaction A' in **Table 7-2**, these include short-term, temporary, indirect, sedimentation impacts to the River Roe and Tributaries SAC and ASSI, to downstream Salmonid Rivers and other water bodies, increased interaction with areas of potential contamination and uplands, sedimentation and soil compaction, temporary reductions in air quality, and the potential for permanent, in-combination or cumulative, negative impacts on the landscape and visual amenity of LCAs of high sensitivity (Binevenagh LCA and Eastern Binevenagh Slopes LCA) and the Binevenagh AONB, from the transmission line and substation development. There is also the potential for slight, long-term, positive cumulative effects on air quality and GHG emissions owing to the potential for increased renewable energy connectivity.

For the two projects grouped as 'Potential Interaction B' in **Table 7-2**, these include short-term, temporary, indirect, sedimentation impacts to the River Roe and Tributaries SAC and ASSI, to downstream Salmonid Rivers and other water bodies, increased interaction with areas of potential contamination and uplands, sedimentation and soil compaction, temporary reductions in air quality, and the potential for short-term, temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of LCAs of high sensitivity (Binevenagh LCA and Eastern Binevenagh Slopes LCA) and the Binevenagh AONB, from the transmission line development and transmission line restring. There is also the potential for slight, long-term, positive cumulative effects on air quality and GHG emissions owing to the potential for increased renewable energy connectivity.

Table 7-2 Projects with potential for in-combination / cumulative effects in the Cam area

Area ID	Potential Interaction	Project No.	Project Name
1	A	19	Cam Cluster
		5	Coolkeeragh – Limavady – Coleraine 110 kV Uprating
		15	Northwest 110 kV Reinforcement
	B	5	Coolkeeragh – Limavady – Coleraine 110 kV Uprating
		15	Northwest 110 kV Reinforcement

7.3.2 Coolkeeragh Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if any of the combinations of projects detailed in **Table 7-3** take place and works begin in the Coolkeeragh area simultaneously.

For the four projects grouped as 'Potential Interaction A' in Table 7-3, these include short-term, temporary, indirect, sedimentation, pollution or disturbance impacts to Lough Foyle SPA, ASSI and RSPB Reserve, increased interaction with areas of potential contamination, sedimentation and soil compaction, temporary reductions in air quality, and the potential for temporary and slight permanent, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of medium to high sensitivity (Lough Foyle Alluvial Plain LCA) from the substation developments and transmission line restrings.

For the three projects grouped as 'Potential Interaction B' in **Table 7-3**, these include short-term direct or indirect sedimentation, pollution or disturbance to the River Faughan and Tributaries SAC and ASSI, and River Faughan Salmonid River, cumulative temporary disturbance to the population within Derry / Londonderry City and Maydown, increased interaction with areas of potential contamination, sedimentation and soil compaction, temporary impacts on agricultural lands, temporary reductions in air quality, and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of LCAs of medium to high sensitivity (Burnigibbagh and Drumahoe LCA, Foyle Valley LCA, and Lough Foyle Alluvial Plain LCA) from the transmission line restrings and switching station development.

For the two projects grouped as 'Potential Interaction C' in **Table 7-3**, these include short-term, temporary, indirect, sedimentation, pollution or disturbance impacts to the River Faughan SAC and ASSI, Lough Foyle SPA, ASSI and RSPB Reserve and to downstream Salmonid Rivers and other water bodies, cumulative temporary disturbance to the population within Derry / Londonderry City, increased interaction with areas of potential contamination, sedimentation and soil compaction, temporary impacts on agricultural lands, temporary reductions in air quality, and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of high sensitivity (Burnigibbagh and Drumahoe LCA) from the transmission line restrings.

The HRA of the TDPNI has determined that there is the potential for in-combination water quality and deterioration effects to occur in the Lough Foyle European sites between the Coolkeeragh – Magherafelt 275kV Circuits Refurbishment, Coolkeeragh – Killymallaght – Strabane 110 kV Uprate, or New North West 110 kV Switching Station and Coolkeeragh – Limavady – Coleraine 110 kV Uprate if they were to be progressed and constructed at the same time.

Table 7-3 Projects with potential for in-combination / cumulative effects in the Coolkeeragh area

Area ID	Potential Interaction	Project No.	Project Name
2	A	21	Coolkeeragh 275 kV Redevelopment

Area ID	Potential Interaction	Project No.	Project Name
		5	Coolkeeragh – Limavady – Coleraine 110 kV Uprating
		9	Coolkeeragh 110 kV Extension
		12	Coolkeeragh – Killymallaght – Strabane 110 kV Uprating
	B	8	New NW 110 kV Switching Station
		5	Coolkeeragh – Limavady – Coleraine 110 kV Uprating
		12	Coolkeeragh – Killymallaght – Strabane 110 kV Uprating
	C	5	Coolkeeragh – Limavady – Coleraine 110 kV Uprating
		12	Coolkeeragh – Killymallaght – Strabane 110 kV Uprating

7.3.3 Strabane Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if the two projects detailed in **Table 7-4** take place and works begin in the Strabane area simultaneously. These include short-term, temporary, indirect, downstream sedimentation or pollution impacts to the River Foyle and Tributaries SAC and ASSI, cumulative temporary disturbance to the population within Ballymagorry, increased interaction with areas of potential contamination, sedimentation and soil compaction, temporary downstream sedimentation or pollution impacts on water bodies, temporary reductions in air quality, and the potential for temporary, in-combination or cumulative, negative impacts within the Sperrin AONB and on the landscape and visual amenity of an LCA of medium to high sensitivity (Foyle Valley LCA) from the transmission line restrings. There is also the potential for slight, long-term, positive cumulative effects on air quality and GHG emissions owing to the potential for increased renewable energy connectivity.

Table 7-4 Projects with potential for in-combination / cumulative effects in the Strabane area

Area ID	Potential Interaction	Project No.	Project Name
3	A	12	Coolkeeragh – Killymallaght – Strabane 110 kV Uprating
		13	Omagh – Strabane 110 kV Uprating

7.3.4 Magherafelt Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if the two projects detailed in **Table 7-5** take place and works begin in the Magherafelt area simultaneously. These include short-term, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including a Salmonid River, increased sedimentation and soil compaction, cumulative loss of agricultural land, temporary reductions in air quality, and the potential for permanent, in-combination or cumulative, negative impacts on the landscape and visual amenity of a LCA of medium - high sensitivity (Magherafelt Farmland LCA) from the substation developments.

The HRA of the TDPNI has determined that there is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh European sites between the Magherafelt 275kV Redevelopment and North Sperrin Regeneration substation projects if any of them were to be progressed and constructed at the same time.

Table 7-5 Projects with potential for in-combination / cumulative effects in the Magherafelt area

Area ID	Potential Interaction	Project No.	Project Name
4	A	18	North Sperrin Generation Substation
		23	Magherafelt 275 kV Redevelopment

7.3.5 Rasharkin Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if the two projects detailed in **Table 7-6** take place and works begin in the Rasharkin area simultaneously. These include short-term, temporary, indirect, downstream sedimentation or pollution impacts to water bodies, increased sedimentation and soil compaction, cumulative loss of agricultural land, and temporary reductions in air quality, from the development of the new circuits in this area. There is also the potential for slight, long-term, positive cumulative effects on air quality and GHG emissions owing to the potential for increased renewable energy connectivity.

Table 7-6 Projects with potential for in-combination / cumulative effects in the Rasharkin area

Area ID	Potential Interaction	Project No.	Project Name
5	A	15	Northwest 110 kV Reinforcement
		14	Mid Antrim Upgrade

7.3.6 Kells Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if the two projects detailed in **Table 7-7** take place and works begin in the Kells area simultaneously. These include short-term, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including two WFD rivers (Kells Water and Connor Burn), increased sedimentation and soil compaction, cumulative loss of agricultural land, and temporary reductions in air quality, and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of high sensitivity (Magherafelt Farmland LCA Tardree and Six Mile Water Slopes LCA) from the substation developments and OHL restring.

Table 7-7 Projects with potential for in-combination / cumulative effects in the Kells area

Area ID	Potential Interaction	Project No.	Project Name
6	A	22	Kells 275 kV Redevelopment
		14	Mid Antrim Upgrade

7.3.7 Moyle Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if the two projects detailed in **Table 7-8** take place and works begin in the Moyle area simultaneously. These include short-term, temporary, indirect, sedimentation or pollution or disturbance of designated birds at Larne Lough SPA, Ramsar and ASSI, cumulative downstream sedimentation or pollution impacts to a coastal water body, increased interaction with areas of potential contamination, sedimentation and soil compaction, temporary reductions in

air quality, and temporary impacts on cultural heritage features, from cabling of line and transmission line restring.

The HRA of the TDPNI has determined that there is the potential for in-combination habitat loss effects to occur in Larne Lough SPA and Ramsar site, East Coast (NI) Marine SPA or North Channel SAC between Ballylumford – Ballyvallagh 110 kV Uprate (NEW) or Ballylumford - Eden 110 kV Circuit Uprate and Moyle Interconnector Capacity Increase projects if any of them were to be progressed and constructed at the same time. There is potential for in-combination water quality and deterioration effects to occur in Larne Lough SPA and Ramsar site, East Coast (NI) Marine SPA or North Channel SAC between Ballylumford – Ballyvallagh 110 kV Uprate (NEW) or Ballylumford - Eden 110 kV Circuit Uprate and Moyle Interconnector Capacity Increase projects if any of them were to be progressed and constructed at the same time. There is potential for in-combination disturbance and displacement effects to occur in Larne Lough SPA and Ramsar site, East Coast (NI) Marine SPA or North Channel SAC between Ballylumford – Ballyvallagh 110 kV Uprate (NEW) or Ballylumford - Eden 110 kV Circuit Uprate and Moyle Interconnector Capacity Increase projects if any of them were to be progressed and constructed at the same time.

Table 7-8 Projects with potential for in-combination / cumulative effects in the Moyle area

Area ID	Potential Interaction	Project No.	Project Name
7	A	1	Moyle Interconnector Capacity Increase
		7	Ballylumford – Ballyvallagh Uprate

7.3.8 Greater Belfast Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if any of the combinations of projects detailed in **Table 7-9** take place and works begin in the greater Belfast area simultaneously.

For the two projects grouped as ‘Potential Interaction A’ in **Table 7-9**, these include short-term, temporary, indirect, sedimentation, pollution or disturbance impacts to Belfast Lough SPA and Ramsar site, Outer Belfast Lough ASSI, Belfast Lough Open Water SPA and Three Mile Water Salmonid River, cumulative temporary disturbance to the population within Metropolitan Newtownabbey, increased temporary interaction with areas of potential contamination, sedimentation and soil compaction, temporary reductions in air quality, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including two WFD rivers (Three Mile Water and Ballymartin Water), and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of two LCAs of medium to high sensitivity (Carrickfergus Shoreline LCA and Three and Six Mile Water Valleys LCA from the developments within Belfast and transmission line restring.

For the two projects grouped as ‘Potential Interaction B’ in **Table 7-9**, these include slight potential for direct or indirect, short-term to permanent impacts on Hillfoot Glen SLNCI, increased sedimentation and soil compaction, temporary reductions in air quality, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including the Connswater WFD River, and the potential for permanent, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of high (Castlereagh Slopes LCA) and medium (Castlereagh Plateau) sensitivity from the substation developments and new transmission lines.

The HRA of the TDPNI has determined that there is the potential for disturbance and displacement effects to occur in the Belfast Lough European sites between the Castlereagh – Rosebank Tower Line Removal or Energising Belfast and Carnmoney – Eden Reinforcement projects if any of them were to be progressed and constructed at the same time. There is also potential for in-combination water quality and deterioration displacement effects to occur in the Strangford Lough European sites between the Ballylumford – Castlereagh 110kV Restring and Castlereagh – Knock 110kV Uprate projects if they were to be progressed and constructed at the same time.

Table 7-9 Projects with potential for in-combination / cumulative effects in the Greater Belfast area

Area ID	Potential Interaction	Project No.	Project Name
8	A	11	Eden – Carnmoney Reinforcement
		10	Energising Belfast
	B	20	Castlereagh 275 kV Redevelopment
		10	Energising Belfast

7.3.9 Omagh Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if any of the combinations of projects detailed in **Table 7-10** take place and works begin in the Omagh area simultaneously.

For the two projects grouped as 'Potential Interaction A' in **Table 7-10**, these include short-term, temporary, indirect, sedimentation an pollution impacts to Drumragh Salmonid River, cumulative temporary disturbance to the population within Omagh town (including in socially sensitive areas), increased temporary interaction with areas of potential contamination, sedimentation and soil compaction, temporary reductions in air quality, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including one WFD river (Drumragh River), and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of high sensitivity (Omagh Farmland LCA) from transmission line restrings. There is also the potential for slight, long-term, positive cumulative effects on air quality and GHG emissions owing to the potential for increased renewable energy connectivity.

For the two projects grouped as 'Potential Interaction B' in **Table 7-10**, these include short-term, temporary, indirect, sedimentation and pollution impacts to water bodies, sedimentation and soil compaction, temporary reductions in air quality, and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of medium - high sensitivity (Omagh Farmland LCA) from the new transmission line and transmission line restring. There is also the potential for slight, long-term, positive cumulative effects on air quality and GHG emissions owing to the potential for increased renewable energy connectivity.

The HRA of the TDPNI has determined that there is the potential for in-combination water quality and deterioration effects to occur in the River Foyle and Tributaries SAC or Lough Foyle European sites between the Omagh main – Dromore Uprate, Strabane – Omagh 110 kV Uprate, Mid Tyrone project and projects if any of them were to be progressed and constructed at the same time.

Table 7-10 Projects with potential for in-combination / cumulative effects in the Omagh area

Area ID	Potential Interaction	Project No.	Project Name
9	A	13	Omagh – Strabane 110 kV Uprating
		16	Omagh – Dromore Uprating
	B	17	Mid Tyrone Upgrade
		16	Omagh – Dromore Uprating

7.3.10 East Tyrone Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if any of the combinations of projects detailed in **Table 7-11** take place and works begin in the east Tyrone area simultaneously.

For the two projects grouped as 'Potential Interaction A' in **Table 7-11**, these include cumulative temporary disturbance to the population within Killyman village, increased temporary sedimentation and soil compaction, temporary reductions in air quality, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including one WFD river (River Rhone (Dungannon)), and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of high - medium sensitivity (Loughgall Orchard Belt LCA) from the new transmission line and transmission line restring.

For the two projects grouped as 'Potential Interaction B' in **Table 7-11**, these include temporary, indirect, downstream sedimentation or pollution impacts to water bodies including two WFD rivers (Torrent River, Tamnamore Stream), increased sedimentation and soil compaction, temporary reductions in air quality, and the potential for permanent, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of high - medium (Dungannon Drumlin and Hills LCA) sensitivity from the substation development and new transmission lines.

Table 7-11 Projects with potential for in-combination / cumulative effects in the East Tyrone area

Area ID	Potential Interaction	Project No.	Project Name
10	A	3	East Tyrone Reinforcement
		17	Mid Tyrone Upgrade
	B	17	Mid Tyrone Upgrade
		6	Drumnakelly – Tamnamore 110 kV Uprating

7.3.11 Armagh / Tandragee Area

There is the potential for a range of cumulative and in-combination impacts to arise locally if any of the combinations of projects detailed in **Table 7-12** take place and works begin in the Armagh / Tandragee area simultaneously.

For the three projects grouped as 'Potential Interaction A' in **Table 7-12**, these include increased temporary sedimentation and soil compaction, temporary reductions in air quality, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including two WFD rivers (Annagh River and Cusher River (Tandragee)), and the potential for permanent, in-combination or cumulative, negative impacts on the landscape and visual amenity of LCAs that are of high or high - medium sensitivity (Upper Bann Floodplain LCA and the Loughgall Orchard Belt LCA) from the new transmission line and substation developments.

For the two projects grouped as 'Potential Interaction B' in **Table 7-12**, these include increased temporary sedimentation and soil compaction, temporary reductions in air quality, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including two WFD rivers (Annagh River, Ballybay River), and the potential for temporary, in-combination or cumulative, negative impacts on the landscape and visual amenity of an LCA of high - medium sensitivity (Loughgall Orchard Belt LCA) from the new transmission line, substation, and transmission line restring.

For the two projects grouped as 'Potential Interaction C' in **Table 7-12**, these include cumulative temporary disturbance to the population within Armagh, Aghacommon, and Edenaveys, increased temporary sedimentation and soil compaction, temporary reductions in air quality, temporary, indirect, downstream sedimentation or pollution impacts to water bodies including four WFD rivers (Ballybay, Callan, Killeen Water, Tall River (Richhill)), and the potential for permanent, in-combination or cumulative, negative impacts on the

landscape and visual amenity of an LCA of high or high - medium sensitivity (Upper Bann Floodplains LCA, Loughgall Orchard Belt LCA, Armagh Drumlins LCA) from the new transmission line and substations.

The HRA of the TDPNI has determined that there is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh European sites between Armagh and Drumnakelly, Drumnakelly to Tamnamore 110kv uprate and Newry Reinforcement projects if any of them were to be progressed and constructed at the same time.

Table 7-12 Projects with potential for in-combination / cumulative effects in the Armagh / Tandragee area

Area ID	Potential Interaction	Project No.	Project Name
11	A	24	Tandragee 275 kV Redevelopment
		2	Armagh and Drumnakelly Reinforcement
		4	Newry Reinforcement
	B	6	Drumnakelly – Tamnamore 110 kV Uprating
		2	Armagh and Drumnakelly Reinforcement
	C	2	Armagh and Drumnakelly Reinforcement
		4	Newry Reinforcement

8 MITIGATION AND MONITORING

8.1 Mitigation

Mitigation measures have been recommended where potential negative impacts on environmental topic areas have been identified from developing the alternative options available to the TDPNI 2023-2032. These mitigation measures aim to prevent, reduce and as fully as possible offset any significant adverse effects on the environment due to implementation of the projects within the TDPNI. The mitigation measures that have been put forward in the TDPNI and SEA processes have been included within Section 8 of the TDPNI.

8.1.1 Environmental Appraisal Report

As the preparation of a TDPNI is an annual rolling process, each TDPNI prepared since the TDPNI 2018-2027 has been accompanied by an Environmental Appraisal Report (EAR) which assessed that version of the plan against the provisions of the adopted SEA statement. This process has ensured a consistency of approach in environmental issues of each TDPNI across the lifespan of the SEA. EARs should continue to be prepared annually to accompany revisions of the TDPNI.

8.1.2 General Mitigation

The principal mitigation recommendation is that the predicted negative effects should be considered further during the next stage of detailed planning and design, when the specifics of the development infrastructure options can be optimised through detailed feasibility studies and design in order to limit identified impacts on sensitive receptors.

Further environmental studies based on the more detailed designs and construction methodologies should be undertaken as appropriate. These studies may involve, but are not limited to, marine, aquatic and terrestrial ecology surveys, ornithological and bat surveys, fish surveys, landscape and visual assessments, WFD assessments, geotechnical investigations and heritage surveys. Further Appropriate Assessment, to meet the requirements of the Habitats Directive, of the detailed designs and construction methodologies will be required at the project level, where potential impacts have been identified in this SEA and accompanying HRA for the TDPNI.

Before any works are carried out, detailed method statements and management plans (construction and environmental) should be prepared, including timing of works, information on the specific mitigation measures to be employed for each works area, and mechanisms for ensuring compliance with environmental legislation and statutory consents.

The timing of construction and maintenance works should be planned to avoid any potential for negative cumulative impacts or inter-relationships with other schemes, plans or projects, yet look to optimise any potential positive cumulative impacts or inter-relationships.

Contractors should be required to prepare Construction Environmental Management Plans (CEMPs), which would include a requirement for related plans to be prepared, as appropriate, for project implementation, such as Erosion and Sediment Control, Invasive Species Management, Emergency Response, Traffic and Safety Management, Dust and Noise Minimisation, and Stakeholder Communication Plans.

Works should only be carried out once the method statements have been consulted on with competent authorities, such as the NIEA. At the project level it will not be sufficient to defer the production of construction method statements. These should be completed in the detailed design stage and may be subject to further Appropriate Assessment where potential impacts have been identified in this SEA and accompanying HRA for the TDPNI. Where there may be unavoidable impacts on protected habitats and / or species the necessary derogation licences should be applied for prior to seeking planning permission or approval for a scheme.

Marine construction and in-stream work have the greatest potential for negative impacts during spawning / breeding and early nursery periods for aquatic and marine protected species. No marine or instream works should occur during restricted periods for relevant species and consultation should be undertaken with the appropriate authorities in this regard.

Monitoring of project-level mitigation measures should be undertaken during and after works, to ensure effectiveness.

All works and planning of works should be undertaken with regard to all relevant legislation, licensing and consent requirements, and recommended best practice guidelines. An ecological clerk of works should be appointed for environmental management of each infrastructure development, and where specific sensitive species may be impacted, an appropriate expert should also be appointed.

As established in Biodiversity Policy ENVP5* and Objective ENVO2*[105], biodiversity restoration and enhancement opportunities should be factored into the implementation of transmission development projects, wherever possible, and this should be monitored in order to ensure that the most appropriate and beneficial measures are being implemented.

8.1.3 Mitigation by Environmental Effect

Table 8-1 provides environmental effect specific mitigation measures that should be adopted within the project stage development of options from the TDPNI to minimise the potential for any negative effects on the wider environment. For transmission development options that are selected to be further investigated these mitigation measures should be implemented and further developed at the next stages of more detailed design / feasibility and project level study.

Table 8-1 Proposed SEA Mitigation Measures

Potential Impact	Proposed Mitigation
1 - Construction phase disturbance, such as noise and habitat degradation, to International, National or locally designated sites and species that are within close proximity to developments.	Good planning and timing of works, and good construction and management practices to keep impacts to a minimum. Environmental Management Plan (EMP) and Construction Management Plan (CMP) to be developed and agreed with relevant authorities and consultees prior to commencement of works. Adhere to SONI / EirGrid / best practice guidelines. Scoping of relevant specialist ecological surveys during the detailed planning stage and prior to any construction works. Where applicable, prior to any vegetation clearance an ecologist should be contracted to undertake a 'pre-vegetation clearance' survey for signs of nesting birds and important species. Should important species be found during surveys the sequential approach of avoid, reduce or mitigate should be adopted to prevent significant impacts. Vegetation clearance should only occur outside the main breeding bird season - September to March. Following construction, replanting, landscaping, natural revegetating and habitat enhancement, should be undertaken in line with appropriate guidelines that aim to improve local biodiversity and wildlife. This is likely to provide for medium- and long-term benefits to the biodiversity, flora and fauna near the working areas. Where possible, original sediment / soil should be reinstated to original levels to facilitate natural restoration and recolonisation of habitat. Restricted working areas should be imposed to ensure minimal disturbance to sensitive habitats.

[105] ENVP5* To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland. ENVO2* To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5.

2 - Construction phase sedimentation impacts on International, National or locally designated sites and species that are within close proximity to developments and where pathways are evident, as constructions works may mobilise sediments into watercourses.	Consultation with environmental bodies on construction methodology and appropriate timing of works to provide the least potential for sediment mobilisation to watercourses. Good planning and timing of works, and good construction and management practices to keep the potential for impacts to a minimum. Minimise requirement for near or in-stream works through good planning. During construction and site establishment operations, silt fencing should be used to prevent disturbed soil reaching the aquatic zone. Any in-stream works should be carried out during low flow conditions and should cease during heavy rainfall and flood conditions, to reduce suspended solids in the river. Buffer zones along waterways can provide mitigation during construction activities. Buffer zones must be of adequate dimensions and impede all free flow to waterways. Heavy machinery and site traffic should be excluded from these areas.
3 - Increased risk of direct physical disturbance to International, National or locally designated sites and species that are within close proximity to developments, including hazards to birds through collision and electrocution.	To avoid or minimise the potential for bird collision with overhead conductors, bird flight deflectors or bird warning spheres should be installed in areas identified as being of high risk or having bird species vulnerable to such impacts. Ornithological surveys should be undertaken during the detailed design stage to identify these sensitive areas and species. Any mitigation measures require monitoring programmes to ensure that they are effective.
4 - Increased rate of spread of invasive species during restring or line development works. Mobile construction equipment traversing through areas of invasive species, potentially carrying these species into new areas.	Cleaning of equipment and machinery along with strict management protocols to combat the spread of invasive species. Pre and post construction surveys for invasive species may be recommended in areas of known invasive species risk. If invasive species are found to be present, an Invasive Species Management Plan should be prepared to outline control and or removal measures to ensure such species are not spread during construction or operation of any future projects.
5 - Creation of a new vector for mobile invasive species in the development of new transmission lines. Corridor clearing may act as a pathway for invasive species.	Cleaning of equipment and machinery along with strict management protocols to combat the spread of invasive species. Pre and post construction surveys for invasive species may be recommended in areas of known invasive species risk. If invasive species are found to be present, an Invasive Species Management Plan should be prepared to outline control and or removal measures to ensure such species are not spread during construction or operation of any future projects.
6 - Construction phase disturbance impacts to marine or aquatic nursery and spawning grounds, such as noise / vibration pollution and physical habitat disturbance.	Consultation with DAERA Inland Fisheries and DAERA Marine and Fisheries Division at the detailed feasibility stage. Known marine spawning and nursery grounds should be avoided where possible, or invasive works minimised in these areas. All works involving open cut crossings should be carried out during the period May to September to avoid interruption of salmonid spawning runs, spawning, incubation of eggs and the early developmental stages.
7 - Construction phase sedimentation impacts to marine or aquatic nursery and spawning grounds, as construction works may	The planning of developments should aim to avoid known marine or aquatic nursery or spawning grounds. Where this cannot be avoided, construction timing should be well planned and works duration and invasive workings should be kept to a minimum in these areas.

cause sediment displacement and blanketing / smothering.	
8 - Construction phase disturbance impacts, such as noise pollution (e.g., cable laying or excavation), to mobile marine and aquatic species (e.g., cetaceans) that are known to frequent the study area.	The planning of developments should aim to avoid known hotspot areas for mobile marine and aquatic species. Where this cannot be avoided, construction times should be kept to a minimum in these areas. Employing Marine Mammal Observers (MMOs) on board construction works vessels can help ensure that impacts of coastal works are minimised. Consultation with DAERA Inland Fisheries and DAERA Marine and Fisheries Division at the detailed feasibility stage. Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010[106]) should be followed for marine based cable laying activities. For SACs which have seals as a site selection feature, the following ranges should be used for when screening for either Harbour or Grey Seals: • All SACs within 135km of the project should be screening for Grey Seals (*Halichoerus grypus)* and • All SACs within 50km should be screened for Harbour Seals (*Phoca vitulina*)
9 - Construction phase noise pollution disturbance impacts to people in close proximity to developments.	Disturbances can be kept to a minimum with good working practices, planning and timing. Adoption of Construction Best Practice. Noise-producing activities such as excavation and piling should only take place during daylight hours and monitoring of these activities should be ongoing. Continued liaison with local communities is advised with regard to complaints concerning noise and vibration emissions resulting from construction works.
10 - Construction phase dust and sediment releases in close proximity to the developments, causing disturbance and negative health impacts to local people.	Disturbances can be kept to a minimum with good working practices, planning and timing. Adoption of Construction Best Practice. Development of dust minimisation plans in advance of works. Dust suppression measures in place during construction, for example establishing appropriate speed limits over unmade surfaces and establishing wheel washing facilities on construction sites. Continued liaison with local communities is advised with regard to complaints concerning dust releases resulting from construction works.
11 - Construction / maintenance phase compaction or destabilisation of peat and other sensitive soils, from heavy equipment traversing an area.	The development of transmission infrastructure across areas of significant soil sensitivity should be avoided where possible at the design stage (e.g., areas of deep and active peat should be avoided where possible). Where areas of sensitive habitat need to be crossed during construction / maintenance works, measures to reduce the impact of vehicles on wetland or bog should be considered including the use, for example, of low-pressure vehicles, wide wheel / tracks and the laying of protective geotextile on the vegetation to be crossed. Construction machinery should also be restricted to site roads and designated access routes. Machinery should not be allowed to access, park or travel over areas outside development construction zones. Where impacts cannot be avoided or reduced, further works should be carried out to compensate for these impacts, or to restore some aspect of the natural environment to an approximation of its previous condition (e.g., where disturbance of peat soils cannot be avoided, there should be some consideration given to possible re-seeding with native species to stabilise the peat and accelerate recovery of the vegetation).
12 - Temporary or permanent loss of crops	Good site management practices and construction management plans and consultation with the competent and statutory authorities prior to any works

[106] JNCC, 2010. Handbook for Phase 1 habitat survey – a technique for environmental audit.

and / or agricultural land due to the disturbance of construction works required for the uprating of existing or development of new transmission infrastructure over agricultural areas.	should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice. Consultation with landowners and / or tenants to identify speciality agricultural crops or lands that may require protection during construction. Consultation with landowners to develop compensation for lost crop value caused by construction works. Land within the working area should be reinstated as near as practical to its former condition.
13 - Construction phase disruption to current land uses, such as noise pollution and dust release from construction works.	Good site management practices and construction management plans and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice. Noise and vibration producing activities such as piling and excavation should only take place during daylight hours and monitoring of these activities should be ongoing in sensitive areas. Development of dust minimisation plans. Dust suppression measures in place during construction, for example establishing appropriate speed limits over unmade surfaces and establishing wheel washing facilities on larger construction sites. Continued liaison with local communities is advised with regard to complaints concerning noise pollutions and dust release resulting from construction works.
14 - Construction phase potential for contaminated materials to be mobilised and tracked through the study area from historically contaminated sites or hazardous soils and activities, impacting on nearby soils and land uses.	Identification of historically contaminated areas and sites and careful route planning during the design stage to avoid these sites where possible, to prevent further contamination. Good management, planning and working practices to minimise contamination of nearby soils and land uses if works crossing historically contaminated sites or hazardous soils cannot be avoided. Good working practices may include installation of wheel wash and plant washing facilities. Strict management and regulation of construction activities. Sampling and analysis of sites prior to construction works in potentially hazardous areas, to establish potential risk.
15 - Access difficulties in topographically unsuitable areas, such as upland and steep slope areas or historic mine sites, and where transport of construction equipment across these areas may be problematic.	Careful route planning during the design stage to avoid topographically unsuitable areas where possible. In some cases, where access for machinery is particularly difficult due to the sensitive nature of habitats or difficult terrain, the aerial transport of materials and machinery by helicopter may be considered.
16 - Construction phase sedimentation impacts to water bodies e.g., construction works may destabilise soil materials, river banks and shorelines.	Good management and planning to keep water quality disturbance to a minimum. Precautions should be put into place to avoid or minimise the generation and release of sediments into any watercourses. Any potential water quality issues from construction should be contained and treated to ensure no damage to natural waterbodies. Construction will have to be planned appropriately, using Best Available Techniques / Technology (BAT) at all times, to ensure water quality issues are kept to a minimum, with no significant adverse effects. Develop, implement and enforce an Erosion and Sedimentation Control Plan (ESCP) where risks are identified to downstream European sites.
17 - Construction phase pollution impacts to water bodies, e.g., construction works may accidentally release pollutants, such as fuels, oils and lubricants.	Pollution prevention guidance notes (PPGs) should be consulted, which provide detailed guidance and appropriate mitigation measures to avoid or reduce the impact on the water environment. Develop, implement and enforce a Water Pollution Prevention and Environmental Emergency Response Plan for all work sites. This should

	include good site practices as described in the Good Practice Guidance notes proposed by EA/SEPA/NIEA. All protective coatings used would be suitable for use in the aquatic environment and used in accordance with best environmental practice. Storage facilities would contain and prevent the release of fuels, oils and chemicals associated with plant, refuelling and construction equipment into the environment. Emergency and spill response equipment should be kept on hand during construction.
18 - Difficult working conditions during construction and maintenance works due to interactions with coastal, pluvial or fluvial flood extents.	Individual developments to be subject to detailed Flood Risk Assessment at the detailed planning stage, where risk has been identified. Avoid flood extents where possible or provide infrastructure that is both resilient to the potential flood risk and provides no transfer of flood risk once developed. Critical infrastructure should not be placed in floodplains where it may be impacted, or where it may be inaccessible during flood events.
19 - Increases in local air emissions and reductions in local air quality from construction plant emissions, in areas of the proposed developments.	Development of dust minimisation plans. Dust suppression measures in place during construction to include regular dampening down of stock piles, establishing appropriate speed limits over unmade surfaces and establishing wheel washing facilities on construction sites. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
20 - Increases in local GHG emissions from construction plant emissions, in areas of the proposed developments.	Plan construction scheduling to minimise vehicle trips. Limit idling of heavy equipment unless needed for the safe operation of the equipment and verify through unscheduled inspections.
21 - Difficult working conditions during construction and maintenance works due to interactions with climate change exacerbated coastal, pluvial or fluvial flood extents.	Individual developments to be subject to detailed Flood Risk Assessment at the detailed planning stage, where risk has been identified, including for climate change scenarios. Avoid climate change flood extents where possible or provide infrastructure that is both resilient to the potential flood risk and provides no transfer of flood risk once developed. Critical infrastructure should not be placed in floodplains where it may be impacted, or where it may be inaccessible during flood events.
22 - Temporary loss of GHG sequestering vegetation in clearance of development area, during and following the construction of new transmission lines, prior to re-establishment.	Good planning and timing of works to minimise construction footprint impacts. Following construction, replanting, landscaping, and natural revegetating, should be undertaken in line with appropriate guidelines that aim to improve local GHG sequestering vegetation cover.
23 - Construction phase disturbance impacts to existing material assets and infrastructure such as transport networks, agricultural, aquaculture, fisheries, and recreation and amenity areas as construction works may	Development of good site management practices, traffic and construction management plans and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Minimise the frequency and duration of road closures. Adoption of Construction Best Practice.

interfere with the functioning of these assets, e.g., road closure or temporary loss of agricultural lands.	
24 - Planning and construction constraints due to the presence of existing infrastructure or other planned developments.	Constraints should be identified and described in as much detail as possible during the early stages of a project, so that awareness of them and their potential impact can be managed. Incorporation of potential impacts and risks associated with other planned developments at the detailed planning stage. Consultation with other asset owners to establish the best possible working arrangements with the least disturbance.
25 - Permanent, direct loss of existing material assets, such as agricultural land, in the development footprint of new transmission infrastructure, e.g., new substations.	Good spatial planning to minimise the potential for such impacts. Consultation with landowners to develop compensation for loss of assets, such as agricultural land, caused by development of new infrastructure. Good site management practices and construction management plans, and consultation with the competent and statutory authorities prior to any works should enable all impacts to be kept to a minimum over a short timescale. Adoption of Construction Best Practice.
26 - Construction phase impacts on the setting of heritage sites and features in close proximity transmission infrastructure, during uprating and construction works.	Where necessary a heritage impact assessment should be prepared in respect of any works to architectural or archaeological features in advance of any works being carried out to feed into detailed design. Consultation and agreement with the Department for Communities, Historic Environment Division, in advance of any works taking place in respect of protected archaeological or architectural features. Construction supervision by qualified project archaeologists, combined with sensitive construction methods and restoration to minimise potential for damages, in potentially sensitive areas. Heritage features damaged could be restored / preserved. Statutory consents and notices may be required prior to works taking place.
27 - Permanent impacts on the setting of heritage sites and features in close proximity transmission infrastructure.	Impacts could be kept to a minimum through sensitive design and planning. Planning and design advice from qualified archaeologists. Statutory consents may be required prior to works.
28 - Potential for loss of or damage to known and unknown heritage features in the development of transmission infrastructure.	Impacts could be kept to a minimum through sensitive design and planning. Planning and design advice from qualified archaeologists. Construction supervision by qualified project archaeologists, combined with sensitive construction methods and restoration to minimise potential for damages, in potentially sensitive areas. Statutory consents may be required prior to works. All new archaeological discoveries are reported in line with legislative requirements. Site-specific surveys may need to be undertaken to prevent any loss to the marine archaeological resource.
29 - Construction phase impacts on the local landscape and local visual amenity from construction equipment and works.	Impacts could be kept to a minimum through good site practice and planning (e.g., screened laydown areas and traffic management). Adoption of Construction Best Practice. Landscape and Visual Assessment of options at the detailed feasibility and detailed planning stages to minimise the potential for impacts and provide site specific mitigation measures.
30 - Permanent impacts on landscape and visual amenity from the	Impacts could be kept to a minimum through sensitive design and planning (e.g., vegetative screening and landscape management planning). Landscape and visual assessment and advice during detailed design. Public

development of new transmission infrastructure.	consultation on draft designs. Landscape and Visual Assessment of options at the detailed feasibility and detailed planning stages to minimise the potential for impacts and provide site specific mitigation measures.

8.2 HRA Mitigation

Appropriate Assessment of individual projects will include timely consultation with relevant planning and environmental authorities, the evaluation of up to date mapping, designations and development plans, policies, and a consideration of any relevant sectoral guidance, such as EC Guidance on Energy Transmission Infrastructure and EU nature legislation (EC, 2018) and updated Ecology Guidelines for Electricity Transmission Project when published by EirGrid.

Where avoidance is not possible adverse effects on site integrity will be avoided through project specific mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation. Mitigation measures shall aim to ensure that no adverse effect on the integrity of a European site occurs.

Where impacts are identified at project level, appropriate mitigation will be developed to ensure the resulting impacts of the construction and operation of a project do not adversely affect the integrity of a European site in view of the site's conservation objectives. Best practice measures identified in EirGrid's benchmarking Evidence-Based Environmental Studies[107].

In addition to the proposed SEA mitigation, **Table 8-2** presents the HRA mitigation measures that will be incorporated into future project specific HRAs and EcIAs, where appropriate. This list of mitigation measures is not designed to be exhaustive and shall be supplemented by project and site-specific mitigation developed by project level Appropriate Assessment and Environmental Impact Assessment.

Table 8-2 Proposed HRA Mitigation Measures

Potential Impact	Proposed Mitigation
1 - Habitat loss - General	Any and all works in or in proximity to a European site will be supervised by an experienced ecologist acting as an Ecological Clerk of Works (ECoW). Direct habitat loss within European sites will be avoided for new-build infrastructure and avoided where reasonably practicable for refurbishment of infrastructure within European sites. When construction occurs within a designated site, sensitive construction techniques will be used such as the use of bog mats for machinery access, particularly if underground cables are proposed or in remote peatland areas. Ecological monitoring will be undertaken at sensitive sites during construction as appropriate. Such sites will be identified on a case by case basis. Restricted working areas will be imposed to ensure minimal disturbance to sensitive habitats. Re-distribute vegetation and soil stripped from the construction areas to provide a seedbank and do not re-seed with Perennial Ryegrass.

[107] http://www.eirgrid.ie/about/in-the-community/environment/

Potential Impact	Proposed Mitigation
	Land within the working area will be reinstated to its former condition or as near as is reasonably practicable.
2 - Habitat loss – Invasive Species	There is the potential for non-native invasive species to be present in proximity to a future project. The introduction of invasive species into a European site can affect the conservation objectives for qualifying habitats or species, potentially adversely affecting the integrity of the European site (e.g., affecting species distribution and abundance and / or out competing native species). Invasive species survey will be undertaken as part of the suite of ecology surveys for projects arising from the TDPNI if appropriate and in accordance with EirGrid (2012). If invasive species are found to be present, an Invasive Species Management Plan will be prepared to outline control and or removal measures to ensure such species are not spread during construction or operation of any future projects.
3 - Habitat loss – Peatland Sites	Areas of deep and active peat shall be avoided, where possible. Detailed peat slip risk assessments shall be carried out as determined on a case by case basis for proposed developments in areas where peat substrates occur on sloped ground. Construction machinery shall be restricted to site roads and designated access routes. Machinery shall not be allowed to access, park or travel over areas outside development construction zones. Peat excavated during construction activity should not be stored (temporarily or otherwise) on areas of adjacent mire habitats or near flushes or drains. Temporary storage of spoil material excavated during the construction phase developments should be stored at suitable locations away from surface watercourses. All spoil material excavated during the construction phase should be reinstated following the completion of the construction phase of a proposed development. Where disturbance of peat soils cannot be avoided, there should be some consideration given to re-seeding with an appropriate range of native species of native or, wherever possible, local provenance to stabilise the peat and accelerate recovery of vegetation.
4 – Water Quality and Habitat Deterioration	In all cases where works have the potential to impact on protected surface water or riparian habitats within or upstream of a European site, measures must be put in place to manage and minimise the risk of escape of elevated levels of suspended solids or polluting substances into watercourses. Develop, implement and enforce an Erosion and Sedimentation Control Plan (ESCP) where risks are identified to downstream European sites. The ESCP must include sufficient pollution control measures to prevent run-off, silt, hydrocarbons or any other harmful substances or substrates from entering any surrounding surface waters. Storage facilities would contain and prevent the release of fuels, oils and chemicals associated with plant, refuelling and construction equipment into the environment.

Potential Impact	Proposed Mitigation
	All protective coatings used would be suitable for use in the aquatic environment and used in accordance with best environmental practice. Develop, implement and enforce a Water Pollution Prevention and Environmental Emergency Response Plan for all work sites. This should include good site practices as described in NIEA Pollution Prevention Guidance (DAERA, 2016) and applicable CIRIA Technical Guidance (CIRIA, 2001; CIRIA, 2006) including methods and procedures to deal with any spills and the timely reporting of incidents. • There shall be no in-stream crossing by machinery. • Silty water will be collected in settlement ponds prior to discharge to watercourses. • Buffering strips will be provided near watercourses. • All works involving open cut crossings shall be carried out during the period of May to September to avoid interruption of salmonid spawning runs, spawning, incubation of eggs and the early developmental stages. • Where appropriate and practical, bank vegetation and bed material which has been removed shall be stored to facilitate its replacement when channel works in the vicinity of a watercourse have been completed. • Works in the vicinity of a watercourse shall be carried out with reference to a water quality protection or surface water management plan for each site which shall ensure that: • All necessary measures shall be taken to minimise the generation and release of sediments into all watercourses. • Levels of suspended solids in the river shall be monitored during the course of the works. • Precautions shall be put in place to avoid spillages of diesel, oil or other polluting substances.
5 – Disturbance and Displacement - Birds	Where feasible, site clearance involving the cutting or destruction of vegetation and hedgerows shall not take place in the bird breeding season between March 1st and August 31st inclusive. Mitigation measures to reduce disturbance effects on feature species birds may include but not be limited to: Timing of works (e.g., avoiding works in or close to SPAs during the bird breeding season [March to August inclusive] or avoiding works in the vicinity of SPAs with over wintering birds between the months of November and March inclusive) Avoid working simultaneously with other projects which could also cause disturbance. Screening of works to reduce disturbance impacts. On the advice of relevant ornithological experts and agencies, conduct surveys where the risk of collision on migratory routes cannot be excluded at

Potential Impact	Proposed Mitigation
	screening stage. Bird warning devices shall be put in place where crossings of sensitive flight corridors cannot be avoided and where a collision risk occurs. Surveys focusing on feature species which can move outside the confines of a European site shall be conducted to ensure any significant flight lines (e.g. regular flight lines for feature species birds related to, but outside of an SPA) or areas of supporting habitat (e.g. foraging areas for feature species birds in close proximity to, but out with an SPA; or otter holts out with an SAC, etc.) would be identified and avoided or appropriate mitigation measure put in place.
6 – Disturbance and Displacement – Otters	Works shall avoid active otter holts. In the event that an otter holt cannot be avoided by the works, it will be necessary to seek a derogation licence from NIEA to exclude otters from the holt. No works shall be undertaken within 150m of any holts at which breeding females or cubs are present. No wheeled or tracked vehicles (of any kind) shall be used within 30m of non-breeding otter holts. Light work, such as digging by hand or scrub clearance shall also not take place within 30m of such holts, except as agreed with NIEA under licence.
7 – Disturbance and Displacement – Marine Mammals	Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010) and appropriate legislation (i.e., The Habitats Regulations (as amended) and Wildlife (NI) Order 1985 (as amended)) will be followed for marine based cable laying activities.

8.3 Monitoring

The SEA Directive requires that significant environmental effects arising from implementation of a Plan or Programme are monitored in order to identify, at an early stage, any unforeseen adverse effects and in order to undertake appropriate remedial action. The proposed monitoring programme in **Table 8-3** is based on the Indicators and Targets established in the SEOs (given in **Section 5.2**). SEA monitoring should be undertaken in conjunction with any proposed review of the TDPNI, in advance of an update, to enable monitoring outcomes to influence the TDPNI development. Much of the environmental monitoring proposed can be collated from ongoing environmental monitoring and reviews undertaken by bodies such as DAERA, NISRA and DfI. The indicators and data proposed for the monitoring of TDPNI implementation are at a strategic level, to match the SEO objectives. The suggested data sources for monitoring of effects are mostly at a strategic level, are nationally consistent and are freely available.

Table 8-3 Proposed Environmental Monitoring of the TDPNI

SEO	Indicator	Target	Proposed Data Source(s)
Objective 1 – Biodiversity, Flora and Fauna Avoid damage to, and where possible enhance, biodiversity, flora and fauna. **Sub-Objectives** 1A - Preserve, protect, maintain and, where possible, enhance internationally protected species and habitats. 1B - Preserve, protect, maintain and, where possible, enhance national and local nature conservation sites, protected habitats and species and other known species of conservation concern.	• Conservation condition of designated habitats and species within International / European sites (SACs, SPAs, Ramsar sites). • Status of designated habitats and species within national and local sites. • Status of protected and priority habitats and species.	• No negative change, or a positive change, in the conservation status of designated habitats and species within International / European sites. • No negative change, or a positive change, in the conservation status of designated habitats and species within national and local sites. • No negative change, or a positive change, in the status of protected or priority species and habitats outside of designated sites.	• DAERA National Site Network reporting (every 6 years) for European sites / Article 17 Habitats Directive reporting and Article 12 Birds Directive reporting for RoI. • DAERA Condition Assessment reporting for ASSIs. • Local Authority – Local Area Plans • DAERA reporting of protected and priority species.
Objective 2 – Population and Human Health Minimise the risk to, and provide benefit for, the community and human health. **Sub-Objectives** 2A - Minimise disruption and displacement to the local population, while providing robust transmission infrastructure. 2B - Minimise risks to human health and social deprivation, while providing robust transmission infrastructure.	• Population density within proximity to potential transmission system developments. • Perceived health of the local population within proximity to potential transmission system developments. • Socially sensitive areas within proximity to potential transmission system developments.	• Low population density within proximity to transmission system developments. • No negative change, or a positive change, in the health of the population within proximity to transmission system developments. • No socially sensitive areas within proximity to transmission system developments.	• NISRA census data. • NISRA statistics on population health. • NIO data on NI Peace Lines • DSD data on Neighbourhood Renewal Areas
Objective 3 – Geology, Soils and Landuse Minimise damage to the function and quality of the soil resource in the study area in	• Loss or damage to protected geological / geomorphological features within international or	• No effects on protected geological / geomorphological features within international or	• DAERA Condition Assessment reporting for ASSIs • GSNI / NIEA data

construction and operation of transmission infrastructure.	national designated sites (UNESCO Geoparks, ASSIs). • Loss or damage to sensitive soils and land uses, e.g., peatlands, ancient woodland, commercial forestry, cultivated lands. • Interactions with potentially hazardous soils and activities, e.g., PPC sites, mines, quarries, historically contaminated sites. • Interactions with topographically difficult sites, e.g., steep slopes and uplands.	national designated sites (UNESCO Geoparks, ASSIs). • No loss of, or damage to, sensitive soils and land uses. • No interaction with hazardous sites and topographically unsuitable areas.	• Woodland Trust, LPSNI, NIEA, GSNI, and Forest Service data • Local Area Plans
Objective 4 – Water Avoid impacts on the status or quality of water bodies and avoid interaction with areas of flood risk. **Sub-Objectives** 4A - Support the objectives of the WFD and Marine Strategy by avoiding damage to or deterioration of water status, quality and resource. 4B - Support the objectives of the Floods Directive by avoiding interactions with coastal, pluvial or fluvial flood extents.	• WFD status of surface, coastal, transitional and groundwater bodies within proximity to potential transmission system developments. • Status of sensitive waterbodies, e.g., drinking and bathing waters within proximity to potential transmission system developments. • Medium probability flood extents - Pluvial and fluvial 100-year and coastal 200-year flood extents.	• No negative change, or a positive change, in the status of surface water and groundwater bodies, including sensitive water bodies, and potential to contribute to the achievement of water body objectives under the WFD. • No deterioration in the status of NI seas, and potential to contribute to the achievement of Good Environmental Status (GES) under the MSFD. • No interaction with areas of flood risk.	• WFD reporting of water body status in RBMPs by DAERA / EPA reporting in RoI. • Monitoring undertaken by DAERA Marine and Fisheries Division under the Marine Strategy / by the EPA under the MSFD in RoI. • DfI data for the NIFRA and FRMP.
Objective 5 - Air Quality Minimise risk to local air quality and contribute to improving regional emissions.	• Development in air quality sensitive areas. • Enable increased renewable energy connection to reduce requirements for fossil fuel burning.	• No transmission system developments within air quality sensitive areas. • Number of transmission system developments that may facilitate increased renewable energy connection.	• Local Authority, DAERA data – Annual air quality monitoring summaries and Continuous air quality monitoring.

Objective 6 - Climatic Factors Adaption of infrastructure to potential climatic change and reduction of GHG emissions from the energy supply sector in line with national commitments. **Sub-Objectives** **6A -** Adaption of infrastructure to potential climatic change. **6B -** Contribute to a reduction in GHG emissions from the energy supply sector in line with national commitments.	• Medium probability climate change (cc) influenced flood extents - Pluvial and fluvial 100 year + cc and coastal 200 year +cc flood extents. • Enable increased renewable energy connection to reduce requirements for fossil fuel burning.	• No transmission system developments within areas of climate change flood risk, unless resilient to flooding. • Number of transmission system developments that may facilitate increased renewable energy connection.	• DfI data for the NIFRA and FRMP. • Met Office regional information. • SONI / NIE – Annual Reporting and Plans.
Objective 7 - Material Assets Provide new, robust electrical transmission infrastructure with minimal disruption to other assets and infrastructure.	• Transmission infrastructure developed or upgraded. • Potential for impacts on transport (road, rail, air) and energy infrastructure (gas). • Potential for loss of or impacts to agricultural land assets.	• Number of transmission system developments developed or upgraded. • No disruption to transport and energy infrastructure. • No loss of agricultural land assets.	• SONI / NIE – Annual Reporting and Plans. • SGN data, Transport NI and Translink data • LPSNI data, CORINE Landcover, DAERA Agricultural Census data.
Objective 8 - Cultural Heritage Protect International, National and Local Heritage Designations, and areas of heritage potential, and their settings.	• Potential for impacts on archaeological heritage features or their setting. • Potential for impacts on architectural heritage features or their setting. • Discovery of previously unknown archaeological heritage features.	• No negative change, or a positive change in the condition or setting of international, national and local heritage designations, in development and operation of infrastructure. • All new archaeological discoveries are reported in line with legislative requirements.	• SONI / NIE – Annual Reporting and Plans. • Statistics on recorded breaches in relation to historic sites. • Heritage at Risk NI (HARNI) Register, with regard to holdings in the rural landscape.
Objective 9 - Landscape and Visual Amenity Minimise the potential for negative impacts on the character and quality of landscapes / seascapes or visual amenity.	• Landscape / seascape sensitivity to infrastructure development. • Potential for impacts on visually sensitive areas, such as AONBs and country parks.	• No negative change, or a positive change, in visual amenity or landscape / seascape character, in development and operation of infrastructure.	• Landscape / Seascape Character Assessments or update to the NI Countryside Survey.

			• SONI / NIE – Annual Reporting and Plans. • Local Development Plans.

9 SUMMARY AND CONCLUSIONS

A Strategic Environmental Assessment was undertaken of the draft Transmission Development Plan for Northern Ireland (TDPNI) for the ten-year period 2023 to 2032.

The SEA Environmental Report has identified the potential positive and negative impacts on the wider environment of undertaking each type of transmission development, and of constructing and operating the potential electricity transmission projects that are included within the TDPNI, along with highlighting the potential cumulative / in-combination impacts of developing these projects. This report is designed to help support the future decision making in implementation of the TDPNI, to ensure that SONI and NIE Networks are fully aware of the environmental constraints and opportunities of potential projects, and to help the future sustainable development of projects that come from the TDPNI.

The significant negative impacts identified by this assessment are limited to two potential projects: Energising Belfast, and the Northwest 110 kV Reinforcement. The significant negative impacts identified for the Energising Belfast project relate to Cultural Heritage in the short-term, reflecting the significant number of heritage features, as well as the Area of Archaeological Potential, that are present in Belfast City and its immediate surrounds. However, should this project be progressed, it should be possible to avoid these sites at the detailed planning and design stage, and mitigation measures have also been proposed that can minimise the potential for these negative impacts. The significant negative impacts identified for the Northwest 110 kV Reinforcement project relate to Geology, Soils and Land Use in the short-term, as the least cost corridor for this project directly intersects a site that is designated nationally for its geological heritage importance. However, should this project be progressed, it should be possible to avoid this site at the detailed route planning and design stage, and mitigation measures have also been proposed that can minimise the potential for these negative impacts.

Several slight to moderate, negative impacts have also been identified from the development and operation of the potential transmission development projects included in the TDPNI. However, many of these potential impacts can be avoided, or mitigated for, during the next detailed design and construction / environmental management planning stages. For the potential projects that relate to transmission infrastructure upgrades (i.e., uprating of existing lines), the negative impacts identified are mainly restricted to the construction phase, leaving no significant medium- or long-term footprint on the wider environment. However, the potential projects that relate to new transmission infrastructure (new OHLs or substations) have the potential for short-, medium- and long-term, slight to moderate negative impacts, owing to their permanent physical and visual disturbance, during and following construction. Mitigation measures have been proposed that can minimise the potential for these negative impacts, if adopted at the detailed planning and design stage of these projects, should they be taken forward. The principal mitigation recommendation is that the predicted negative effects should be considered further during the next stage of detailed planning and design, when the specifics of the development infrastructure options can be optimised through detailed feasibility studies and design in order to limit identified impacts on sensitive receptors. Further environmental studies based on the more detailed designs and construction methodologies should be undertaken as appropriate and may include, for instance, surveys of various biotic groups, landscape and visual assessments, or heritage assessments, with any recommended avoidance or mitigation measures applied to ensure that there are no significant negative environmental effects during construction or operation of the transmission infrastructure. Further Appropriate Assessment, to meet the requirements of the Habitats Directive, of the detailed designs and construction methodologies will be required at the project level, where potential impacts have been identified in this SEA and accompanying HRA for the TDPNI. At the project implementation stage, all works and planning of works should be undertaken with regard to all relevant legislation, licensing and consent requirements, and recommended best practice guidelines. Areas that may be more sensitive to these transmission developments have also been highlighted, to help inform SONI of the areas that should be avoided to minimise potential environmental impacts.

In the medium- and long-term, the development of these potential transmission projects has the potential for slight to moderate positive impacts, including the improved reliability of the grid network, support of economic growth, and facilitating the connection and supply of more renewable energy. These positive impacts in turn will help to ensure that electricity supply is able to meet future demand, and that there is less reliance on fossil fuels into the future, resulting in better air quality and less GHG emissions. Furthermore, the projects in the TDPNI could play a key role in shaping a reliable and sustainable energy future for Northern Ireland and help achieve the 2030 renewable electricity target of the Climate Change Act.

The HRA Screening of the 79 potential projects that could come forward under the TDPNI during the plan period identified that likely significant effects on European sites could not be discounted for 42 potential projects without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects. This included the potential for significant habitat loss, water quality and habitat deterioration, and disturbance and displacement impacts on European sites from implementation of these projects.

A shadow HRA of the TDPNI was prepared to document an appropriate assessment of the implications of the TDPNI on European sites in view of their conservation objectives. Having conducted further investigation and analysis; and having applied measures appropriate at a plan level intended to avoid or reduce the harmful effects of the implementation of their plan on European sites; and taking into consideration the safeguarding regime of lower level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI prior to those projects being consented under the planning code; it is concluded that implementation of the TDPNI will not adversely affect the integrity of any European site.

While SONI is the competent authority for the purpose of preparing the TDPNI and associated SEA, some projects will likely require statutory consent under the provisions of the Planning Act (Northern Ireland) 2011, implemented by the relevant planning authority.

10 NEXT STEPS

Consultations on the draft TDPNI 2023-2032, Environmental Report and HRA are anticipated to commence in September 2023 and run for 12 weeks. These documents will be made available for viewing digitally via the SONI website – http://www.soni.ltd.uk.

Following completion of the consultation period, all comments will be collated and the draft TDPNI, Environmental Report and HRA will be reviewed and revised as necessary. Provided there are no objections or comments that will significantly alter the draft TDPNI, the final version of the TDPNI can be drafted and adopted. This is anticipated to be in Q1 2024. Following release of the adopted TDPNI, an SEA Statement will be drafted to summarise the process undertaken and identify the manner by which environmental considerations and consultations were integrated into the final TDPNI. **Table 10-1** demonstrates the proposed upcoming time stages for the TDPNI, SEA and HRA.

Table 10-1 Draft Anticipated Milestones

TDPNI	Dates	SEA / HRA
Development of draft TDPNI	October 2022 – September 2023	Strategic Environmental Assessment and Appropriate Assessment. Writing of Environmental Report and HRA.
Public and statutory consultation on draft TDPNI	September 2023 – December 2023	Statutory, Non-Statutory and Public Consultation on Environmental Report and HRA.
Release of Final TDPNI	Q1 2024	SEA Environmental Statement

Following adoption of the final TDPNI the next stage of development for any of the potential options is detailed design and further detailed study, incorporating the advice and mitigation measures proposed in these environmental reports.

The contact information for any information regarding the SEA of the draft TDPNI is as follows:

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APPENDIX A

SEA Guidance

Northern Ireland

A Practical Guide to the Strategic Environmental Assessment Directive. September 2005. Office of the Deputy Prime Minister. https://www.gov.uk/government/publications/strategic-environmental-assessment-directive-guidance

Guidance on Sustainability Appraisal and Strategic Environmental Assessment for the Historic Environment. June 2018. Department for Communities – Historic Environment Division

Strategic Environmental Assessment. Services and Standards for Responsible Authorities. Environment and Heritage Service. https://www.daera-ni.gov.uk/publications/strategic-environmental-assessment

Other

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Good Practice Guidance on SEA Screening. EPA 2021. https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/SEA_Screening_GoodPractice_2021.pdf

Good Practice Guidance on SEA for the Energy Sector. EPA 2021. https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/good-practice-note-on-sea-for-the-energy-sector.php

Good Practice Guidance on Cumulative Effects Assessment in SEA. EPA 2020. https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/good-practice-guidance-on-cumulative-effects-assessment-in-sea.php

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Developing and Assessing Alternatives in SEA. EPA 2015. https://www.epa.ie/publications/research/biodiversity/EPA-157_web.pdf

Guidance on Consideration of Air in Strategic Environmental Assessment. April 2017. Scottish Environment Protection Agency.

Guidance on Consideration of Climatic Factors within Strategic Environmental Assessment. March 2010. Scottish Environment Protection Agency.

Guidance on Consideration of Material Assets in Strategic Environmental Assessment. August 2016. Scottish Environment Protection Agency.

Guidance on Consideration of Soil in Strategic Environmental Assessment. April 2017. Scottish Environment Protection Agency.

EirGrid

Cultural Heritage Guidelines for Electricity Transmission Projects. October 2015. Eirgrid.

Ecology Guidelines for Electricity Transmission Projects. 2020. Eirgrid. https://www.eirgridgroup.com/site-files/library/EirGrid/Ecology-Guidelines-for-Electricity-Transmission-Projects.pdf

EirGrid Evidence Based Environmental Studies Study 1: EMF. July 2014. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 2: Cultural Heritage. November 2015. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 3: Bats. December 2015. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 4: Habitats. May 2016. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 5: Birds. May 2016. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 6: Water Quality & Aquatic Ecology. May 2016. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 7: Soils & Geology. May 2016. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 8: Noise. May 2016. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 9: Settlement and land use. May 2016. Eirgrid.

EirGrid Evidence Based Environmental Studies Study 10: Landscape & Visual. June 2016. Eirgrid.

EMF & You: Information about Electric & Magnetic Fields and the electricity transmission system in Ireland. July 2014. Eirgrid

APPENDIX B

Plans and Programmes

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft TDPNI
International / European			
Biodiversity			
UN Convention on Biological Diversity (1992)	Maintenance and enhancement of Biodiversity, and strategies to ensure a fair and equitable sharing of the benefits from the use of genetic resources.	• Conservation of biological diversity (or biodiversity); • Sustainable use of its components; and • Fair and equitable sharing of benefits rising from genetic resources. • Development of national strategies for the conservation and sustainable use of biological diversity.	The draft TDPNI should have regard for this Convention and look for opportunities to conserve, and, where possible, restore or enhance biodiversity. Environmental protection objectives of the Convention are reflected in the SEOs for Biodiversity, Flora and Fauna.
Ramsar Convention on Wetlands of International Importance (1971 and amendments)	Protection and conservation of wetlands.	• Objectives include protection and conservation of wetlands, particularly those of importance to waterfowl as Waterfowl Habitat.	The draft TDPNI should ensure that European Sites, including a consideration of Ramsar sites, are suitably protected from loss or damage. Appropriate Assessment is being undertaken for the draft TDPNI, to ensure that its implementation will not adversely affect European Sites. Environmental protection objectives of the Convention are reflected in the SEOs for Biodiversity, Flora and Fauna.
Bern Convention (Convention on European Wildlife and Natural Habitats) (1982)	The Bern Convention is a binding international legal instrument in the field of nature conservation, covering most of the natural heritage of the European continent and extending to some States of Africa.	• Objectives are to conserve wild flora and fauna and their natural habitats, as well as to promote European co-operation in this field. • The treaty also takes account of the impact that other policies may have on natural heritage.	The draft TDPNI should have regard for this Convention and look for opportunities to conserve, and, where possible, restore or enhance biodiversity. Environmental protection objectives of the Convention are reflected in the

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft TDPNI
			SEOs for Biodiversity, Flora and Fauna.
The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) (1992)	The current instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. Objectives include the protection of the marine environment.	• Prevention and elimination of pollution, and protection of the maritime area against the adverse effects of human activities, to safeguard human health and to conserve marine ecosystems.	The draft TDPNI should have regard for the Convention and ensure that it does not compromise its objectives, and that it contributes to achieving its aims. Environmental protection objectives of the Convention are reflected in the SEOs for Water.
Bonn Convention on the Conservation of Migratory Species of Wild Animals [L210, 19/07/1982 (1983)]	The Bonn Convention focuses on preserving the habitats used by migratory species and aims to enhance the conservation of terrestrial, marine and avian species on a global scale throughout their range.	• Establishes a legal foundation for internationally coordinated conservation measures throughout a migratory range. • Migratory species threatened with extinction are listed on Appendix I of the Convention. Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. • In Europe, legislation to ensure that the provisions of the Bonn convention are applied includes the Birds Directive and the Habitats Directive.	The draft TDPNI should have regard for any implications on migratory species. Environmental protection objectives of the Convention are reflected in the SEOs for Biodiversity, Flora and Fauna.
EU Biodiversity Strategy to 2030 [COM(2020)380]	Aims to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people, climate and the planet. The Strategy aims to build societies' resilience to future threats such as: the impacts of climate change, forest fires, food insecurity and disease outbreaks.	The strategy contains specific commitments and actions to be delivered by 2030: • Establishing a larger EU-wide network of protected areas on land and at sea. Enlarging of existing Natura 2000 areas with strict protection for areas of very high biodiversity and climate value. • Launching an EU nature restoration plan. Including concrete commitments and actions (and proposed binding nature restoration	The draft TDPNI should have regard for this strategy and look for opportunities to conserve, and, where possible, restore or enhance biodiversity. Environmental protection objectives of the strategy are reflected in the SEOs for Biodiversity, Flora and Fauna.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft TDPNI
		targets) to restore degraded ecosystems by 2030 and manage them sustainably, addressing the key drivers of biodiversity loss. • Introducing measures to enable the necessary transformative change. Unlocking funding for biodiversity, and setting in motion a new, strengthened governance framework. • Introducing measures to tackle the global biodiversity challenge. In particular, working towards adoption of an ambitious global biodiversity framework under the Convention on Biological Diversity.	
EU Directive on the conservation of wild birds (Birds Directive) [2009/147/EC]	Protects all wild birds, their nests, eggs and habitats within the European Community. It gives EU member states the power and responsibility to classify Special Protection Areas (SPAs) to protect birds which are rare or vulnerable in Europe, as well as all migratory birds which are regular visitors.	• Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex I. • Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); ensure the upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones, re-establish destroyed biotopes and creation of biotopes • Measures for regularly occurring migratory species not listed in Annex I are required as regards their breeding, moulting and wintering areas and staging posts along their migration routes. The protection of wetlands, and particularly wetlands of international importance.	The draft TDPNI should ensure that European Sites are suitably protected from loss or damage. Appropriate Assessment is being undertaken for the draft TDPNI, to ensure that its implementation will not adversely affect European Sites. Environmental protection objectives of the Directive are reflected in the SEOs for Biodiversity, Flora and Fauna.
EU Directive on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) [92/43/EEC]	Builds on the Birds Directive (see above) by protecting natural habitats and other species of wild plants and animals. Together with the Birds Directive, it underpins a European network of protected areas known as Natura 2000: Special Protection Areas (SPAs, classified under the Birds	• Propose and protect sites of importance to habitats, plant and animal species. • Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in	The draft TDPNI should ensure that European Sites are suitably protected from loss or damage. Appropriate Assessment is being undertaken for the draft TDPNI, to ensure that its

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	Directive) and Special Areas of Conservation (SACs, classified under the Habitats Directive).	Annex II, to enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range. • Carry out comprehensive assessment of habitat types and species present. • Establish a system of strict protection for the animal species and plant species listed in Annex IV.	implementation will not adversely affect European Sites. Environmental protection objectives of the Directive are reflected in the SEOs for Biodiversity, Flora and Fauna.
Convention for the Conservation of Salmon in the North Atlantic	This Convention recognises that salmon originating in the rivers of different states intermingle in certain parts of the North Atlantic Ocean.	• The key objectives of the Convention are the desire to promote the acquisition, analysis and dissemination of scientific information pertaining to salmon stocks in the North Atlantic Ocean and the desire to promote the conservation, restoration, enhancement and rational management of salmon stocks in the North Atlantic Ocean through international cooperation.	The draft TDPNI should contribute towards the achievement of the desires of the Convention and the Articles therein.
North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019 – 2024	Implementation plan for the protection of salmon, following the Convention for the Conservation of Salmon in the North Atlantic.	The Plan details measures to be taken over five-year periods in relation to three areas of concern: • Management of salmon fisheries. • Protection and restoration of Atlantic salmon habitat. • Management of aquaculture, introductions and transfers and transgenics.	The draft TDPNI should contribute towards the achievement of the objectives of this Plan for any development with the potential to impact this species and the goals of the plan, including transboundary considerations.
Population / Human Health			
Seveso Directive III [2012/18/EU]	Prevention of harmful effects on humans and the environment through major accidents involving dangerous substances.	Objectives seek to prevent major accidents involving dangerous substances and limit their consequences for man and the environment, with a view to ensuring high levels of protection throughout the Community.	The draft TDPNI has an indirect link to this Directive, owing to the inclusion of certain power stations as COMAH establishments in NI.

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INTERREG Peace Plus Programme	INTERREG is an EU Programme aimed at fostering and supporting cooperation between different regions of the EU. Peace Plus is a cross-border EU funding programme for the 2021-2027 period, which aims to build on and continue the work of both the Interreg VA and Peace IV programmes.	Peace Plus will continue to support activities that contribute towards a prosperous and stable society in Northern Ireland and the border counties of Ireland; including activities that promote peace and reconciliation and contribute to the cross border economic and territorial development of the region.	The draft TDPNI should have regard for this programme in the planning of transmission infrastructure.
Climate Change			
Paris Agreement (UNFCCC, 2016)	A legally binding international treaty on climate change, adopted by 196 parties at the UN Climate Change Conference (COP21) in December 2015. It aims to strengthen the global response to the threats of climate change by keeping this century's global temperature rise below 2 degrees Celsius above pre-industrial levels.	The Paris Agreement and the outcomes of the UN climate conference (COP21) cover all the crucial areas identified as essential for a landmark conclusion: • Mitigation – reducing emissions fast enough to achieve the temperature goal; • A transparency system and global stock-take – accounting for climate action; • Adaptation – strengthening ability of countries to deal with climate impacts; • Loss and damage – strengthening ability to recover from climate impacts; and • Support – including finance, for nations to build clean, resilient futures.	The draft TDPNI should aim to contribute towards climate change mitigation. The TDPNI may contribute to reducing GHG emissions by connecting renewable energy generators to the system. Environmental protection objectives of the Agreement are reflected in the SEOs for Climatic Factors.
UN Kyoto Protocol, the Doha Amendment, The United Nations Framework Convention on Climate Change (UNFCC, 1997)	The Framework Convention on Climate Change seeks to alleviate the impacts of climate change and reduce global emissions of GHGs. The Protocol operationalises this Convention. It was adopted in December 1997 and entered into force in February 2005.	• Commits industrialised countries and economies in transition to limit and reduce GHG emissions in accordance with agreed individual targets. • Places a heavier burden on developed countries under the principle of "common but differentiated responsibility and respective capabilities". • Annex B sets binding emission reduction targets for 37 industrialised countries and economies in transition and the EU. Overall, the targets for the first period (2008-2012)	The draft TDPNI can contribute to achieving emission reduction targets through connection of renewable energy generators to the system. Environmental protection objectives of the Protocol are reflected in the SEOs for Climatic Factors.

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		added up to an average 5% emission reduction compared to 1990 levels. • The Doha Amendment was adopted in December 2012 and entered into force in December 2020. This set a second period (2013-2020) with new commitments and a revised list of GHG to be reported.	
EU 20-20-20 Climate and Energy Package Agreement (2007)	Objectives seek to alleviate the impacts of climate change and reduce global emissions of GHGs.	To meet the EU's obligation under international law and in line with European ambition. Member States are required to: • 20% cut in GHG emissions collectively (from 1990 levels) • 20% of EU energy produced from renewables • 20% improvement in energy efficiency The collective EU target of reducing emissions by 20% by 2020 is to be achieved by: The EU Emissions Trading System, the backbone of the EU mitigation effort, which sets a cap on emissions from the most polluting sectors, including over 11 000 factories, power plants and other installations, including airlines. By 2020, the cap should result in a 21 % reduction relative to 2005 levels. The EU ETS covers about 40 % of all EU emissions. The 'effort sharing decision', which operates outside the EU ETS and establishes annual binding GHG emission targets for individual Member States for the 2013-2020 period. These concern emissions from sectors such as waste, agriculture, buildings, etc. The '20-20-20' targets are supported by the long-term target of 85-90 % reduction in GHG emissions against 1990 levels by 2050.	As an EU Member State when the Agreement was produced, the UK was subject to its obligations. The more recent Energy Strategy for Northern Ireland sets out more stringent targets relating to GHG emissions and the energy sector. The TDPNI can contribute to achieving emission reduction targets through connection of renewable energy generators to the system. Environmental protection objectives of the Agreement are reflected in the SEOs for Climatic Factors.
The European Green Deal 2019	The European Green Deal is a plan to make the EU's economy sustainable.	The growth strategy outlines transformation of the EU to a resource-efficient and competitive economy where:	As an EU Member State when the strategy was produced, the UK was subject to its obligations.

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		• There are no net emissions of GHGs by 2050; • Economic growth is decoupled from resource use; and • No person and no place is left behind. The Deal provides an Action Plan to: • Boost the efficient use of resources by moving to a clean circular economy; and • Restore biodiversity and cut pollution.	The Climate Change Act (Northern Ireland (2022) has subsequently been introduced, setting a legal framework for a net zero target of GHG emissions by 2050 from baseline levels. The TDPNI can contribute to achieving emission reduction targets through connection of renewable energy generators to the system. Environmental protection objectives of the strategy are reflected in the SEOs for Climatic Factors.
Renewable Energy Directive (2009/28/EC)	This Directive establishes a common framework for the use of energy from renewable sources in order to limit greenhouse gas emissions and to promote cleaner transport. The Member States are to establish national action plans which set the share of energy from renewable sources consumed in transport, as well as in the production of electricity and heating, for 2020.	It requires the EU to fulfil at least 20% of its total energy needs with renewable by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.	The draft TDPNI can contribute to achieving renewable energy targets through connection of renewable energy generators to the system. Environmental protection objectives of the Directive are reflected in the SEOs for Climatic Factors and Material Assets.
EU Strategy on Adaptation to Climate Change	The Adaptation Strategy recognise how important impact assessment is for climate proofing, identifies the key priorities for action and how EU policies can encourage effective adaptation action.	The strategy was adopted by the EC in April 2013. It outlines the measures for taking climate change preparedness to a new level. The strategy has three main objectives: • Promote climate action in Member States through encouraging the adoption of adaptation strategies; • The promotion of informed decision-making through addressing knowledge gaps and the development of the European Climate Adaptation Platform for better knowledge dissemination; and • Promoting adaptation in key vulnerable sectors.	As an EU Member State when the strategy was produced, the UK was subject to its obligations. The NICCAP2 outlines the risks and opportunities relevant to Northern Ireland, as identified in the UK Climate Change Risk Assessment 2017. The TDPNI should aim to contribute towards climate change mitigation and infrastructure to be planned for and resilient to climatic change.

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Forging a climate-resilient Europe – the new EU Strategy on Adaptation to Climate Change 2021[COM(2021)82]	The Strategy outlines a long-term vision for the EU to become a climate-resilient society, fully adapted to the unavoidable impacts of climate change by 2050 and complements the EU's goal of becoming climate neutral by this date. Deepens and expands upon adaptation actions in the 2013 EU Adaptation Strategy.	This strategy aims to reinforce the adaptive capacity of the EU and the world, and minimise vulnerability to the impacts of climate change, in line with the Paris Agreement and the proposal for European Climate Law. It seeks to step up action across the economy and society in synergy with other Green Deal policies such as biodiversity protection and sustainable agriculture. The Strategy has three objectives, and proposes a range of actions in order to meet them: • To make adaptation smarter - improving knowledge and availability of data, while managing the inherent uncertainty brought upon us by climate change; securing more and better data on climate-related risk and losses; and making Climate-ADAPT the authoritative European platform for adaptation knowledge. • To make adaptation more systemic - supporting policy development at all levels of governance, society and the economy and in all sectors by improving adaptation strategies and plans; integrating climate resilience in macro-fiscal policy, and promoting nature-based solutions for adaptation. • To speed up adaptation across the board – by accelerating development and rollout of adaptation solutions; reducing climate-related risk; closing the climate protection gap; and ensuring the availability and sustainability of fresh water.	As an EU Member State when the strategy was produced, the UK was subject to its obligations. The NICCAP2 outlines the risks and opportunities relevant to Northern Ireland, as identified in the UK Climate Change Risk Assessment 2017. The TDPNI should aim to contribute towards climate change mitigation and infrastructure to be planned for and resilient to climatic change.
Second European Climate Change Programme (ECCP II) 2005.	Objectives seek to develop the necessary elements of a strategy to implement the Kyoto protocol.	Develop a framework for a low carbon economy which will be achieved through a National Mitigation Plan (to lower GHG emissions) and a National Adaptation Framework (to provide for	The draft TDPNI will need to have regard for this programme in the planning of transmission infrastructure. The TDPNI can

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		responses to changes caused by climate change). This includes: • Reform of the EU Emissions Trading System (EU ETS) to include a cap on emission allowances in addition to existing system of national caps • Agreement of national targets for non-EU ETS emissions from countries outside the EU • Commitment to meet the national renewable energy targets of 16% for Ireland by 2020 • Preparation of a legal framework for technologies in carbon capture and storage	contribute towards climate change mitigation though connection of renewable energy generators to the system.
EU Green Infrastructure Strategy (COM(2013) 249 final).	Aims to develop preserve and enhance healthy green infrastructure to help stop the loss of biodiversity and enable ecosystems to deliver their many services to people and nature. The greater the scale, coherence and connectivity of the green infrastructure network, the greater its benefits. The EU Strategy on green infrastructure aims to outline how to deploy such a network and encourages action at all levels.	The Green Infrastructure strategy is a key step towards the success of the EU Biodiversity Strategy. It is made up of four main elements: • Promoting Green Infrastructure in the main EU policy areas • Supporting EU-level GI projects • Improving access to finance for GI projects • Improving information and promoting innovation.	The draft TDPNI will need to have regard for this strategy in regard to the development of green infrastructure as part of transmission infrastructure developments.
Air Quality			
Stockholm Convention (2004)	The Stockholm Convention is an international treaty with the aim of eliminating or restricting the production and use of persistent organic pollutants (POPs).	The main objective of the treaty is in seeking to protect human health and the environment from POPs.	The draft TDPNI will need to have regard for this Convention with regard to the potential for cumulative emission effects.
WHO Air Quality Guidelines – global update (2005).	Objectives seek the elimination or minimisation of certain airborne pollutants for the protection of human health.	• Air Quality Guidelines (AQGs) were published by the WHO in 1987 and revised in 1997 and most recently in 2005.	The draft TDPNI should have regard for the environmental protection objectives of these guidelines, in terms of cumulative emissions

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		• These offer guidance on threshold limits for key air pollutants that pose health risks and provide a reference for setting air pollution targets at regional and national levels to improve air quality. • The 2005 guidelines offer recommended exposure levels for particulate matter (PM10 and PM2.5), ozone, nitrogen dioxide and sulphur dioxide, as well as a set of interim targets to encourage a progressive improvement in air quality.	affecting air quality from the energy supply sector and other sources. The TDPNI may be able to contribute to reducing air emissions by connecting renewable energy generators to the system.
The Gothenburg Protocol (1999), as amended in 2012.	The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) is a multi-pollutant protocol designed to reduce acidification, eutrophication and ground-level ozone by setting emissions ceilings for sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia to be met by 2010. The protocol was updated and amended in 2012.	• The 1999 Protocol set national emission ceilings for 2010 for four pollutants: sulphur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs) and ammonia (NH_3). • As amended in 2012, the Protocol includes national emission reduction commitments to be achieved by 2020 and beyond • Parties must report on their emissions annually and are required to provide projections of their future emissions.	The draft TDPNI should have regard for the environmental protection objectives of the Protocol, relating to the control of emissions from construction. The TDPNI may be able to contribute to reducing air emissions by connecting renewable energy generators to the system. These environmental protection objectives are reflected in the SEOs for Air Quality.
Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive [2008/50/EC] & 4th Daughter Directive of the Air Quality Framework Directive [2004/107/EC]	Set air quality standards for protection of human health and the environment. Addresses air pollution at the level of zones, while the complementary NEC Directive addresses total emissions.	• The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) was published in May 2008. It replaced the Framework Directive and the first, second and third Daughter Directives. • Sets limit and target values for certain pollutants. Covers in particular nitrogen dioxide (NO2) and particulate matter or fine dust (PM10), which is emitted by traffic and combustion engines. • Lays down limit values to be respected by Member States in their zones.	The draft TDPNI should have regard for the environmental protection objectives of these Directives, relating to the control of emissions from construction. The TDPNI will be obliged to comply with air quality standards set out in these Directives and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system.

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		• The 4th Daughter Directive relates to arsenic cadmium, mercury, nickel and polycyclic aromatic hydrocarbons.	These environmental protection objectives are reflected in the SEOs for Air Quality.
Industrial Emissions Directive [2010/75/EU]	• Aims to achieve a high level of protection of human health and the environment taken as a whole by reducing harmful industrial emissions across the EU, in particular through better application of Best Available Techniques (BAT) • Around 50,000 installations undertaking the industrial activities listed in Annex I of the Industrial Emissions Directive (IED) are required to operate in accordance with a permit (granted by the authorities in Member States).	The IED is based on several pillars, in particular (1) an integrated approach, (2) use of best available techniques, (3) flexibility, (4) inspections and (5) public participation: • The integrated approach means that the permits must take into account the whole environmental performance of the plant. • The permit conditions including emission limit values must be based on the Best Available Techniques (BAT). • The IED allows competent authorities some flexibility to set less strict emission limit values. • The IED contains mandatory requirements on environmental inspections. Member States shall set up a system of environmental inspection and draw up inspection plans accordingly. • The IED ensures that the public has a right to participate in the decision-making process, and be informed of its consequences, by having access to permit applications, permits and the results of the monitoring releases.	The draft TDPNI should have regard for the environmental protection objectives of the Directive, which includes protection from emissions from certain power plants, in terms of cumulative emissions affecting air quality.
National Emissions reduction Commitments (NEC) Directive [2016/2284/EU]	This Directive seeks to limit the national emissions of certain airborne pollutants for the protection of human health and the environment. Implements at the EU level obligations under the Geneva Convention and Gothenburg Protocol.	It sets the limits on total national emissions from four pollutants - sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia. These can cause acidification (e.g., the chemical composition of the sea acidifies), water and soil pollution (eutrophication) and ground-level ozone (ozone resulting from the	The draft TDPNI should have regard for the environmental protection objectives of the Directive, relating to the control of emissions from construction. The TDPNI should, where possible, contribute to the protection of air quality. Connection of

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	It replaced the earlier National Emission Ceilings for Certain Atmospheric Pollutants Directive (2001/81/EC).	reaction of the four pollutants with heat and sunlight).	renewable energy infrastructure could contribute to reducing national emissions. These environmental protection objectives are reflected in the SEOs for Air Quality and Climatic Factors.
Geneva Convention (1979) on Long-range Transboundary Air Pollution (LRTAP)	International agreement with the aim of limiting problems of air pollution on a broad regional basis.	• First international legally binding instrument dealing with problems of air pollution on a broad regional basis. It was signed in 1979 and entered into force in 1983. It has since been extended by eight specific protocols. • Under the Convention, the parties commit to working together to limit, to gradually prevent, and to reduce their discharges of air pollutants in order to combat the resulting transboundary pollution. • The Convention has substantially contributed to the development of international environmental law and has created the essential framework for controlling and reducing the damage to human health and the environment caused by transboundary air pollution.	The draft TDPNI should have regard for the environmental protection objectives of the Directive, relating to the control of emissions from construction. Environmental protection objectives of the Convention are reflected in the SEOs for Air Quality and Climatic Factors.
Sustainable Development			
Eighth Environmental Action Programme (EAP) (2021-2030) of the European Community	The Programme provides a framework for the EU's overall environmental policy development and guides the policy-making by identifying priorities and setting out a long-term vision and goals.	• Replaces the 7th programme. • The new 10-year programme keeps the 2050 vision and enforces it by aiming to accelerate the EU transition to a climate-neutral, resource efficient clean circular economy in a just and inclusive way, fully endorsing the environmental and climate objectives of the European Green Deal. The 8th EAP should also provide a basis for the	The draft TDPNI will need to have regard for this programme in the planning of transmission infrastructure.

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		achievement of the environmental objectives of the UN Agenda 2030 and its 17 SDGs. • The 8th EAP has 6 thematic priority objectives in areas of: • Climate neutrality • Adaptation and resilience to climate change and other environmental risks • Circular economy and regenerative growth decoupling economy from resource use and environmental degradation • Zero pollution ambition for a toxic-free environment • Protecting and restoring biodiversity, and enhancing natural capital • Environmental sustainability and reduction of the environmental pressures from production and consumption.	
EUROPE 2020 A strategy for smart, sustainable and inclusive growth (COM/2010/2020)	Europe 2020 is a 10-year growth strategy proposed by the European Commission in 2010 for advancement of the EU economy. It aims at "smart, sustainable, inclusive growth", with greater coordination of national and European policy. It follows the Lisbon Strategy for the period 2000–2010.	The Strategy set five overarching objectives to be reached by 2020: • Employment: 75% of population aged 20-64 should be employed; • Innovation: 3% EU's GDP should be invested in R&D; • Climate Change: 20/20/20 climate/energy targets should be met (including an increase to 30% of emissions reduction if conditions are right); • Education: Share of early school leavers should be under 10% and at least over 40% of the younger generation should have a tertiary degree; and • Poverty: At least 20m fewer people in at-risk-of-poverty and social exclusion.	Environmental protection objectives of the Strategy, with regard to climate change objectives, are reflected in the SEO for Climatic Factors.

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Roadmap to a Resource Efficient Europe (COM(2011) 571)	Outlines how to transform the EU economy to a sustainable one by 2050. It proposes ways to increase resource productivity and decouple economic growth from resource use and its environmental impact. It sets out a vision for the structural and technological change needed up to 2050, with milestones to be reached by 2020. These milestones illustrate what will be needed to put Europe on a path to resource efficient and sustainable growth.	• Areas where policy action can make a real difference are a particular focus, and specific bottlenecks like inconsistencies in policy and market failures are tackled to ensure that policies are all going in the same direction. • Cross-cutting themes such as addressing prices that do not reflect the real costs of resource use and the need for more long-term innovative thinking are also in the spotlight. • Key resources are analysed from a life-cycle and value-chain perspective. Nutrition, housing and mobility are the sectors responsible for most environmental impacts; actions in these areas are being proposed to complement existing measures.	The draft TDPNI should have regard for the environmental protection objectives of this roadmap in planning for transmission infrastructure and could potentially have implications on achieving renewable energy targets.
SEA Directive [2001/42/EC]	To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development.	• Requires that Plans & Programmes take into account protection of the environment and integration of the Plan into the sustainable planning of the country as a whole. • Eleven sectors are specified in the Directive and Competent Authorities (Plan/ Programme makers) must subject specific Plans and Programmes for these sectors to an environmental assessment where they are likely to have significant effects on the environment.	The draft TDPNI will be subject to the SEA process. This is being undertaken through this SEA Scoping Report and subsequent Environmental Report.
EIA Directive [85/337/EEC] [2014/52/EU]	The objective of this Directive is to require Environmental Impact Assessment of the environmental effects of those public and private projects, which are likely to have significant effects on the environment. Aims to assess and implement avoidance or mitigation measures to eliminate environmental effects, before consent is given of projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location.	• All projects listed in Annex I are considered as having significant effects on the environment and compulsorily require an EIA. • For projects listed in Annex II, a "screening procedure" is required to determine the effects of projects on the basis of thresholds/criteria or a case-by-case examination. The competent authority may	The draft TDPNI will have regard to the EIA Directive in the development of any infrastructure. Development and operation of certain transmission development projects included in the TDPNI may be subject to EIA.

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	Projects of this type are subject to a requirement for development consent and an assessment with regard to their effects.	give a decision on whether a project requires EIA. • Requirement for identification, description and assessment in an appropriate manner, in the light of each individual case, on the direct and indirect effects of a project on the following factors: human beings, fauna and flora, soil, water, air, climate and the landscape, material assets, cultural heritage, and the interactions between these factors. • Requirement for consultation with relevant authorities, stakeholders and the public, allowing sufficient time for these to make a submission before a decision is made. • Establishment of a recognised structure and content for the Environmental Impact Statement, which is the document submitted as a written account of the EIA. • Inclusion of proposed flood risk management schemes in EIA screening process	
Energy Efficiency Directive [2012/27/EU]	European Union directive which mandates energy efficiency improvements within the European Union.	The aim of the EU Energy Efficiency Directive was to save energy and to reach the EU's energy savings targets: • By 2020, a 20% cut in energy consumption, or in absolute terms -calculated in million tons of oil equivalent (Mtoe) - 1483 Mtoe in 2020 compared to projected consumption in that year of 1842 Mtoe for the EU as a whole. • The Directive included a legal obligation to establish energy saving schemes in all Member States: energy distributors or retail energy sales companies were obliged to save 1.5 % of their energy sales annually, by volume, through the implementation of energy efficiency measures such as improving the efficiency of heating systems, installing double glazed windows or	The draft TDPNI will be obliged to comply with the requirements of this Directive, particularly in regard to metering and monitoring. Development and operation of new electricity transmission infrastructure should contribute to improved energy efficiency.

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		insulating roofs, among final energy customers.	
EU Thematic Strategy for Soil Protection [COM/2006/231] and Report on its implementation [COM/2012/046]	Strategy for the protection of soils across the EU.	The Strategy consists of: • A communication from the commission, explaining why further action is needed to ensure a high level of soil protection, sets the overall objective of the strategy and explains the kinds of measures that must be taken. It establishes a 10-year work programme for the Commission; • A proposal for a framework Directive, setting out common principles for protecting soils across the EU. Within this common framework, Member States can decide how best to protect soil and how to use it in a sustainable way; and • An impact assessment, analysing the economic, social and environmental impacts of the different options considered in preparation of the Strategy and the measures retained. The 2012 report outlines implementation of the Strategy and ongoing activities, the blocking of progress on the proposed framework Directive, current soil degradation trends and future challenges.	Environmental protection objectives of the Strategy are reflected in the SEO for Geology, Soils and Landuse.
Integrated Pollution Prevention Control Directive [96/61/EC], as amended by Directive 2008/1/EC	To achieve a high level of protection of the environment through measures to prevent or, where that is not practicable, to reduce emissions to air, water and land from industrial sources.	The Directive provides an integrated approach to establish pollution prevention from stationary “installations”. This codified act includes all the previous amendments to the Directive 96/61/EC and introduces some linguistic changes and adaptations.	The draft TDPNI should have regard for the environmental protection objectives of the Strategy. The plan should aim to not cause any negative impacts on air, water or land quality, and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system.

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			These environmental protection objectives are reflected in the SEOs for Air Quality and Climatic Factors.
UN 2030 Agenda for Sustainable Development	The UN 2030 Agenda envisages "a world of universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination". It is grounded in the Universal Declaration on Human Rights and international human rights treaties and emphasises the responsibilities of all states to respect, protect and promote human rights.	The Agenda's 17 Sustainable Development Goals (SDG), and their 169 targets, aim to: Eradicate poverty in all forms and "seek to realize the human rights of all and achieve gender equality".	The draft TDPNI should have regard for the environmental protection objectives of the Agenda in the planning of transmission infrastructure. It should promote sustainable planning and management in the development and operation of transmission infrastructure.
REPowerEU 2022	Plan to safeguard EU citizens and businesses from energy shortages in response to hardships and global energy market disruption caused by Russia's invasion on Ukraine.	REPowerEU aims to help the EU to: • Save energy • Produce clean energy • Diversify its energy supplies	The draft TDPNI should have regard for the environmental protection objectives of the Plan in the planning of transmission infrastructure.
Water			
Water Framework Directive (2000/60/EC), (as amended by Decision 2455/2001/EC and Directives 2008/32/EC, 2008/105/EC and 2009/31/EC.	Aims to improve water quality and quantity within rivers, estuaries, coasts and aquifers. Aims to prevent the deterioration of aquatic ecosystems and associated wetland by setting out a timetable until 2027 to achieve good ecological status or potential. Member States are required to manage the effects on the ecological quality of water which result from changes to the physical characteristics of water bodies. Action is required in those cases where these "hydro-morphological" pressures are having an ecological impact which will interfere with the ability to achieve WFD objectives.	• Identification and establishment of individual river basin districts. • Preparation of individual river basin management plans for each of the catchments. These contain the main issues for the water environment and the actions needed to deal with them. • Establishment of a programme of monitoring water quality in each RBD. • Establishment of a Register of Protected Areas (includes areas previously designated under the Freshwater Fish and Shellfish Directives which have become sites designated for the protection of economically	The draft TDPNI should have regard for the environmental protection objectives of the WFD in the planning of transmission infrastructure. It will need to consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims. Environmental protection objectives of the Directive are reflected in the SEOs for Water and Biodiversity, Flora and Fauna.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft TDPNI
	The following Directives have been subsumed into the Water Framework Directive: • The Drinking Water Abstraction Directive • Sampling Drinking Water Directive • Exchange of Information on Quality of Surface Freshwater Directive • Shellfish Directive • Freshwater Fish Directive • Groundwater (Dangerous Substances) Directive • Dangerous substances Directive	significant aquatic species under WFD and placed on the Protected Areas register). • Promotion of sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimising the effects of flooding and drought events and facilitating long term improvements in water quality, including the protection of groundwater near landfill sites, as well as minimising agricultural runoff.	
Marine Strategy Framework Directive (2008/56/EC)	• Establishes a framework whereby the necessary measures are undertaken to achieve or maintain good environmental status in the marine environment by the year 2020. • Requires the development and implementation of marine strategies in order to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected. • It aims to prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Article 3(8), so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.	• Preparation of an assessment of the current environmental status of the waters concerned and the environmental impact of human activities. • Establishment of a series of environmental targets and associated indicators. • Development of a programme of measures designed to achieve or maintain good environmental status, by 2020. • Establishment of a monitoring programme for ongoing assessment and regular updating of targets. • Cooperation with transboundary Member States to implement these measures.	The draft TDPNI should have regard for the environmental protection objectives of the MSFD in the planning of transmission infrastructure. The TDPNI could have implications on the environmental status of marine waters. Development and operation of transmission infrastructure should aim to avoid impacts on the marine environment. Environmental protection objectives of the Directive are reflected in the SEOs for Water.
Floods Directive (2007/60/EC)	This Directive provides a framework for the assessment and management of flood risks, aiming to reduce the adverse consequences associated with flooding for human health, the environment, cultural heritage and economic activity.	Member States must: • Assess the risk of flooding of all water courses and coast lines, • Map the flood extent and assets and humans at risk in these areas at River Basin level and in areas covered by Article 5(1) and 13(1); and	The draft TDPNI should have regard for the environmental protection objectives of the Floods Directive in the planning of transmission infrastructure. The TDPNI should consider the implications of the flood risk arising

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		• Implement flood risk management plans and take adequate and coordinated measures to reduce this flood risk. Member States are required to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by the end of 2015. The public must be informed and allowed to participate in the planning process.	from development options, particularly those located along the coast or in the vicinity of rivers. Environmental protection objectives of the Directive are reflected in the SEOs for Water.
Bathing Water Directive (2006/7/EC)	The overall objective of the revised Bathing Water Directive remains the protection of public health whilst bathing. It: • Imposes stricter standards for water quality and the implementation of new method of assessment. • Establishes a more pro-active approach to the assessment of possible pollution risks, and to the management of bathing waters; and • Places considerable emphasis on promoting increased public involvement, and for improved dissemination of information on bathing water quality to the general public.	• Updates the way in which water quality is measured, focusing on fewer microbiological indicators, and setting different standards for inland and coastal bathing sites. • Reduces the health risks linked to bathing by setting scientifically based minimum water quality standards. • Makes changes to monitoring and sampling frequency. • Allows a limited number of water samples to be disregarded during short term pollution incidents, if the event is predicted and the public warned beforehand. • Provides better information to the public, allowing more informed choices to be made about the risk of bathing. • Improves the overall management of bathing water quality by requiring an assessment of potential sources of pollution. • Is compatible with other EU water related legislation, in particular the Water Framework Directive.	The draft TDPNI should have regard for the environmental protection objectives of this Directive in the planning of transmission infrastructure, relating to the potential for cumulative effects on waters used for recreation. Development and operation of electrical transmission infrastructure should not negatively impact on designated bathing waters.

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Groundwater Directive [80/68/EEC] and Daughter Directive [2006/118/EC]	• Aims to protect groundwater from pollution by controlling discharges and disposals of certain dangerous substances to groundwater. • Made under the Water Framework Directive, the Daughter Directive aims to prevent and limit inputs of pollutants to groundwater.	• Establishment of criteria for assessing good groundwater status and for the identification of significant and sustained upwards trends and the starting points for trend reversal. • Threshold values adopted for the pollutants, groups of pollutants and indicators of pollution which have been identified as contributing to the characterisation of bodies or groups of bodies of groundwater as being at risk.	The draft TDPNI should have regard for the environmental protection objectives of this Directive in the planning of transmission infrastructure. The TDPNI should, where possible, contribute to the protection of groundwater from point source and diffuse pollution that could be caused or exacerbated by development options. Environmental protection objectives of the Directive are reflected in the SEOs for Water.
Drinking Water Directive (98/83/EC)	• Aimed at the improvement and maintenance of the quality of water intended for human consumption. • Aims to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean.	• Sets values applicable to water intended for human consumption for a defined range of parameters. • Requires implementation of all measures necessary to ensure that regular monitoring of the quality of water intended for human consumption is carried out, in order to check that the water available to consumers meets the requirements set out in the legislation. • Any failure to meet the required standards is immediately investigated in order to identify the cause. • Any necessary remedial action is taken as soon as possible to restore its quality and gives priority to their enforcement action. • Undertake remedial action to restore the quality of the water where necessary to protect human health. • Notification of consumers when remedial action is being undertaken, except where the competent authorities consider the non-compliance with the required standards value to be trivial.	The draft TDPNI may have implications for waters used as a drinking water supply. The draft TDPNI should have regard for the environmental protection objectives of this Directive in the planning of transmission infrastructure. Development and operation of electrical transmission infrastructure should not negatively impact on designated drinking waters.

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Environmental Quality Standards Directive (Directive 2008/105/EC) (also known as the Priority Substances Directive), as amended by Directive 2013/39/EU.	Establishes environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Article 16 of the Water Framework Directive and aims to achieve good surface water chemical status in accordance with the provisions and objectives of Article 4 of the Water Framework Directive.	• Apply the EQS laid down in Part A of Annex I to this Directive for bodies of surface water. • Determine the frequency of monitoring in biota and/or sediment of substances. • Monitoring shall take place at least once every year, unless technical knowledge and expert judgment justify another interval. • Notify the European Commission if the substances for which EQS have been established if a deviation of the monitoring is planned along with the rationale and approach. • Establish an inventory, including maps, if available, of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive for each river basin district.	Impacts on water quality are of relevance to the TDPNI, as infrastructure development options have potential to be associated with water pollution. Development and operation of electrical transmission infrastructure should aim to not negatively impact on any environmental quality standards.
Environmental Liability Directive [2004/35/EC]	• Establishes a framework for environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage. • Relates to environmental damage caused by occupational activities (listed in Annex III), and to any imminent threat of such damage occurring by reason of any of those activities; damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.	• Describes procedures for circumstances where environmental damage has occurred. Requires the polluter to take all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment of services and the necessary remedial measures. • Establishes measures for cases where environmental damage has not yet occurred, but there is an imminent threat of such damage occurring. • The regulations make the polluter financially liable and allow the competent authority to initiate cost recovery proceedings where appropriate.	The draft TDPNI will be obliged to comply with the requirements of the Directive and to prevent environmental damage. Development and operation of electrical transmission infrastructure should aim to cause no damage to the wider environment.

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A Blueprint to Safeguard Europe's Water Resource [COM(2012/673]	The Blueprint aims to improve implementation of existing water policy, to integrate water considerations into other policy areas and indicate where further measures may be necessary for water efficiency and adaptation to climate change.	• Outlines actions that relate to better implementation of current water legislation, integration of water policy objectives into other policies and filling gaps particularly in relation to water quantity and efficiency. • These actions are to ensure that water of sufficient quantity and good quality is available to service the needs of people as well as the environment and the EU's economy. • The Blueprint's time horizon is closely related to the EU 2020 Strategy particularly the Resource Efficiency Roadmap, of which the Blueprint is the water milestone. However, the Blueprint covers a longer time span, up to 2050, and is expected to be the driver of long-term EU water policy rural development programme.	The draft TDPNI should have regard for this Blueprint. Development and operation of electrical transmission infrastructure should aim to cause no damage to the water environment.
Waste			
Waste Electrical and Electronic Equipment Directive [2002/96/EC], as recast by [201219/EU]	EU rules on waste electrical and electronic equipment (widely known as WEEE or e-waste) aim to contribute to sustainable production and consumption. They address environmental and other issues caused by the growing number of discarded electronics in the EU.	The WEEE Directive aims to contribute to sustainable production and consumption by: • preventing the creation of WEEE as a first priority • contributing to the efficient use of resources and the retrieval of secondary raw materials through re-use, recycling and other forms of recovery • improving the environmental performance of everyone involved in the life cycle of EEE In order to achieve these objectives, the Directive: • requires the separate collection and proper treatment of WEEE and sets targets for their collection as well as for their recovery and recycling	The draft TDPNI should consider the implications of this Directive for developmental infrastructure options within the Plan that are likely to result in waste electrical equipment being generated.

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		• helps European countries fight illegal waste exports more effectively by making it harder for exporters to disguise illegal shipments of WEEE • reduces the administrative burden by calling for the harmonisation of national EEE registers and of the reporting format	
Waste Framework Directive [2008/98/EC], as amended in 2018 [2018/51/EU]	• Sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. • Explains when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products.	The Directive requires that: • Waste is managed without endangering human health • Waste is managed without harming the environment. • Waste is managed without harming water, air, soil, plants or animals. • Waste does not cause a nuisance a nuisance through noise or odours, or to countryside or places of special interest.	The draft TDPNI should consider the implications of this Directive for developmental infrastructure options within the Plan that are likely to result in waste electrical equipment being generated.
Cultural Heritage			
Valletta Convention (1992)	Convention for the Protection of the Archaeological Heritage of Europe (revised) (Valletta, 1992). The Valletta Treaty aims to protect the European archaeological heritage "as a source of European collective memory and as an instrument for historical and scientific study	Sets guidelines for the funding of excavation and research work and publication of research findings. Deals with public access, in particular to archaeological sites, and educational actions to be undertaken to develop public awareness of the value of the archaeological heritage. The Convention constitutes an institutional framework for pan-European co-operation on the archaeological heritage, entailing a systematic exchange of experience and experts among the various States. The Committee responsible for monitoring the application of the Convention assumes the role of strengthening and co-ordinating archaeological heritage policies in Europe.	The draft TDPNI should consider sites of archaeological heritage and ensure that they are protected from loss or damage resulting from the development of infrastructure. Environmental protection objectives of the Treaty are reflected in the SEO for Cultural, Architectural and Archaeological Heritage.

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Granada Treaty (1985)	Convention for the Protection of the Architectural Heritage of Europe (Granada, 1985). The main purpose of the Convention is to reinforce and promote policies for the conservation and enhancement of Europe's heritage. It also affirms the need for European solidarity with regard to heritage conservation and is designed to foster practical co-operation among the Parties.	• Conservation of European architectural heritage.	The draft TDPNI should consider sites of architectural heritage and ensure that they are protected from loss or damage resulting from the development of infrastructure. Environmental protection objectives of the Treaty are reflected in the SEO for Cultural, Architectural and Archaeological Heritage.
World Heritage Convention [WHC-2005/WS/02]	Objectives seek to ensure the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage and ensure that effective and active measures are taken for these. The Convention recognises the way in which people interact with nature and encourages signatories to integrate the protection of cultural and natural heritage into regional planning programmes, set up staff and services at their sites, undertake scientific and technical conservation research and adopt measures which give this heritage a function in the day-to-day life of the community.	• Establishment of measures for the protection of monuments of national importance by virtue of the historical, architectural, traditional, artistic or archaeological interest attaching to them. Includes the site of the monument, the means of access to it and any land required to preserve the monument from injury or to preserve its amenities. • World Heritage Sites in Ireland are specific locations that have been included in the UNESCO World Heritage Programme list of sites of outstanding cultural or natural importance to the common heritage of humankind. Two such sites in Ireland have been designated	The draft TDPNI should consider sites of archaeological, architectural, cultural and natural heritage and ensure they are protected from loss or damage resulting from the development of infrastructure. Environmental protection objectives of the Treaty are reflected in the SEO for Cultural, Architectural and Archaeological Heritage.
Landscape			
European Landscape Convention [ETS No. 176]	• Promotion of the protection, management and planning of European landscapes and organising European co-operation on landscape issues. • Applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban areas. • Inclusion of landscapes that might be considered outstanding as well as everyday or degraded landscapes.	• Respond to the public's wish to enjoy high-quality landscapes and to play an active part in the development of landscapes. • Each administrative level (national, regional and local) should draw up specific and/or sectoral landscape strategies within the limits of its competences. These are based on the resources and institutions which, when co-ordinated in terms of space and time, allow policy implementation to be	The draft TDPNI could potentially have implications on landscapes and visual amenity. Infrastructure should be planned to avoid sensitive landscapes. Environmental protection objectives of the Treaty are reflected in the SEO for Landscape and Visual Amenity.

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	• Aimed at the protection, management and planning of all landscapes and raising awareness of the value of a living landscape. • Complements the Council of Europe's and UNESCO's heritage conventions.	programmed. The various strategies should be linked by landscape quality objectives.	

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National			
Biodiversity			
Biodiversity Strategy for Northern Ireland to 2020	A strategy for Northern Ireland to meet its international obligations and local targets to protect biodiversity	The strategy sets out the proposals for action to help halt the loss of biodiversity and the degradation of ecosystems up to 2020. 1. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society 2. Reduce the direst pressures on biodiversity and promote sustainable development 3. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity 4. Enhance the benefits to all from biodiversity and ecosystem services 5. Enhance implementation through participatory planning, knowledge management and capacity building.	The draft TDPNI should look for opportunities to conserve, and where possible, restore biodiversity. Environmental protection objectives of the strategy are reflected in the SEOs for Biodiversity, Flora and Fauna.
UK Post-2020 Biodiversity Framework	Succeeds the UK Biodiversity Action Plan and 'conserving Biodiversity – the UK Approach'. Sets out the UK's response to the CBD's 'Strategic Plan for Biodiversity 2011-2020' and its 20 'Aichi Targets' (2010), and the EU Biodiversity Strategy (2011).	The Framework demonstrates how the work of the four countries and the UK contributes to achieving the Aichi Targets, and identifies the activities required to complement the country biodiversity strategies in achieving the Targets.	The draft TDPNI should look for opportunities to conserve, and where possible, restore biodiversity. Environmental protection objectives of the framework are reflected in the SEOs for Biodiversity, Flora and Fauna.

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		The following are the Strategic Goals of the Framework: • Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society; • Reduce the direct pressures on biodiversity and promote sustainable use; • To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity; • Enhance the benefits to all from biodiversity and ecosystems; and • Enhance implementation through participatory planning, knowledge management and capacity building	
Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, and amendment Regulations	These Regulations give effect to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and the Minister to designate special areas of conservation (endangered species and habitats of endangered species) as a contribution to an EU Community network to be known as NATURA 2000. See EU Habitats Directive.	Protects certain birds, plants, animals, marine life and their habitats, including Natura 2000 sites, through creating criminal offences and changing planning requirements.	The draft TDPNI should ensure that European Sites are suitably protected from loss or damage. Appropriate Assessment is being undertaken for the draft TDPNI, to ensure that its implementation will not adversely affect European Sites. Environmental protection objectives of the Regulations are reflected in the SEOs for Biodiversity, Flora and Fauna.
Wildlife and Natural Environment Act (Northern Ireland) 2011	Amended the Wildlife (Northern Ireland) Order 1985 by giving protection to a wider range of plants, animals and birds, and providing additional enforcement powers and increased penalties for wildlife related offences. The Act also introduced a statutory duty on all public bodies to further the conservation of biodiversity.		The draft TDPNI should have regard for the environmental protection objectives of the Act in the planning of transmission infrastructure. The draft TDPNI will have a 'Duty of Care' to conserve biodiversity. Environmental protection objectives of the Act are reflected in the SEOs for Biodiversity, Flora and Fauna.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
The Environment (Northern Ireland) Order 2002	Covers several environmental issues, including pollution prevention control, assessment and management of air quality, and designation of areas of special scientific interest (ASSIs).		The draft TDPNI should have regard for the environmental protection objectives of this legislation in the planning of transmission infrastructure. The draft TDPNI should look for opportunities to conserve, and where possible, restore biodiversity, should aim to not cause any negative impacts on air quality, and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system. Environmental protection objectives of the Regulations are reflected in the SEOs for Biodiversity, Flora and Fauna, and for Air Quality.
DAERA Conservation Management Plans for SACs (in prep.)	Series of Management Plans for SACs in Northern Ireland, determining the pressures and threats to habitats and species at the sites, and identifying the management actions required to address these pressures.	In line with obligations under The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended), measures must be put in place to maintain and, where needed, improve the ecological health of NI SACs (58 no.) In 2017, NIEA began a 4-year work programme to develop a series of Management Plans.	The draft TDPNI should ensure that European Sites are suitably protected from loss or damage, with regard to the information provided in these Conservation Management Plans. Environmental protection objectives to protect European designated sites are reflected in the SEOs for Biodiversity, Flora and Fauna.
Fisheries Act (Northern Ireland) 1966 (as amended)	Main legislation underpinning DAERA's overall responsibilities with regard to Inland Fisheries.	The following sections of the Act may be of particular consideration to the draft TDPNI: Section 47 - covers the applicant's responsibilities relating to Penalties for Pollution and the consequences of causing or permitting the release of any deleterious materials into any waters. Section 48 - any works in or on the riverbank must be permitted under section 48 of the Fisheries Act (Northern Ireland) 1966 which is issued by DAERA Inland Fisheries.	The draft TDPNI should have regard for the environmental protection objectives of this legislation in the planning of transmission infrastructure. The draft TDPNI should aim to not cause any negative impacts on water (quality, quantity or access) that could affect fish.

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		Section 54 - relates to the construction of fish passes in dams in rivers (maintenance of fish passage over any dam). Sections 58 and 59 - relate to Water Abstractions.	
UK National Ecosystem Assessment (2011)	Provides a comprehensive overview of the state of the natural environment in the UK and a new way of estimating our national wealth. Northern Ireland is covered in Chapter 18. The four key components are: 1. environmental spaces; 2. cultural practices; 3. cultural values; and 4. benefits need to be considered if CES are to be fully addressed in the ecosystem service framework		The draft TDPNI should ensure that the natural environment is suitably protected from loss or damage in its implementation.
Northern Ireland Species and Habitat Action Plans	Northern Ireland Species and Habitat Action Plans are published to assist delivery of the Northern Ireland Biodiversity Strategy, for the protection and enhancement of Northern Ireland Priority Species populations and areas of Priority Habitats which in turn supports Nature Recovery Networks and Green Growth Strategies.	A wide range of actions for these habitats and species continues to be undertaken, e.g., through the management of designated sites, planning regulation, agri-environment schemes and grant-aided projects, but have not been specifically designed to fully implement these action plans or any overarching Habitat and Species Action Plan.	The draft TDPNI should look for opportunities to conserve, and where possible, restore biodiversity. Environmental protection objectives to protect European designated sites and species are reflected in the SEOs for Biodiversity, Flora and Fauna.
Northern Ireland Peatland Strategy 2021-2040	The strategy outlines a range of strategic objections and actions considered necessary to ensure that semi-natural peatlands are conserved and restored to functioning ecosystems.	The objectives of the Northern Ireland Peatland Strategy 2021-2040 include: • By 2040, all peatlands supporting semi-natural vegetation being managed for their peatland biodiversity and ecosystem function; • By 2030, degraded peatland habitats prioritised for restoration to favourable conservation status; • By 2040, all high priority degraded peatlands under restoration management;	The draft TDPNI should have regard for the environmental protection objectives of the Strategy in the planning of transmission infrastructure

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		and also by 2040, that high priority degraded peatlands in Northern Ireland are under sustainable management.	
(ROI) National Biodiversity Action Plan 2017-2022 and Ireland's 4th National Biodiversity Action Plan (draft, 2022)	ROI National strategy for the maintenance and enhancement of biological diversity, which should be integrated across other policy sectors. The draft 4th National Biodiversity Action Plan (NBAP) will set the national biodiversity agenda for the period 2023-2027 and aims to deliver the transformative changes required to the ways in which we value and protect nature.	The key targets for the current plan include: • Mainstream biodiversity in the decision-making process across all sectors. • Substantially strengthen the knowledge base for conservation management and sustainable use of biodiversity. • Increase awareness and appreciation of biodiversity and ecosystems services. • Conserve and restore biodiversity and ecosystem services in the wider countryside. • Conserve and restore biodiversity and ecosystem services in the marine environment. • Expand and improve on the management of protected areas and legally protected species. • Strengthen international governance for biodiversity and ecosystem services. The draft 4th NBAP has the following six Objectives: • Adopt a whole of Government, whole of society approach to biodiversity. • Meet urgent conservation and restoration needs. • Secure nature's contribution to people. • Embed biodiversity at the heart of climate action. • Enhance the evidence base for action on biodiversity. • Strengthen Ireland's contribution to international biodiversity initiatives.	The draft TDPNI should have regard for the current and draft action plans and look for opportunities to conserve, and, where possible, restore or enhance biodiversity, from potential transboundary impacts.
Population / Human Health			

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Control of Major Accident Hazards (COMAH) Regulations (Northern Ireland) 2015	Implements the majority of the Seveso III Directive in Northern Ireland. This controls major accident hazards involving dangerous substances.	• Certain establishments in Northern Ireland are subject to the COMAH Regulations. • Objectives seek to prevent major accidents involving dangerous substances and limit their consequences for man and the environment, with a view to ensuring high levels of protection throughout the Community.	The draft TDPNI has an indirect link to the COMAH Regulations, owing to the inclusion of certain power stations as COMAH establishments in NI.
Climate Change / Air Quality			
Northern Ireland's second Climate Change Adaptation Programme (NICCAP2) 2019 – 2024	The NICCAP2 contains the NICS Departments response to the risks and opportunities relevant to Northern Ireland, as identified in the UK Climate Change Risk Assessment 2017 (CCRA 2017). It sets out preparation for climate change impacts that are already happening and puts in place plans for future impacts.	• NICCAP2 focusses on priority areas identified in the NI Evidence Report as requiring urgent adaptation action over the next 5 years: • Sets the strategies, policies and actions by which government departments will deliver on the agreed outcome objectives	The draft TDPNI should aim to contribute towards climate change adaptation and infrastructure to be planned for and resilient to climatic change. Environmental Protection Objectives are reflected in SEOs for Climatic Factors and Water.
UK Climate Change Act 2008	The Climate Change Act, the first of its kind in any country, set out a framework for moving the UK to a low-carbon economy.	The key component of the legislation requires a mandatory 60% cut in the UK's carbon emissions by 2050. Two key aims underpinning the Act: 1. Improve carbon management and help the transition towards a low carbon economy in the UK 2. Demonstrate strong UK leadership internationally, signalling that we are committed to taking our share of responsibility for reducing global emissions in the context of developing negotiations on a post-2012 global agreement at Copenhagen in 2009.	The draft TDPNI should aim to contribute towards climate change mitigation. The Plan can contribute towards achieving renewable energy targets through connection of renewable generators to the electricity system. Environmental Protection Objectives of the Act are reflected in the SEO for Climatic Factors.
The Climate Change Act 2008 (2050 Target Amendment) Order 2019	Sets a legal requirement to reduce the UK's emissions of GHGs by 100% relative to 1990 levels by 2050.	Legislative basis for achieving the 'net zero' target by 2050, increasing the previous target committed to within UK legislation.	The draft TDPNI should aim to contribute towards climate change mitigation. The Plan can contribute towards achieving renewable energy targets through

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			connection of renewable generators to the electricity system. Environmental Protection Objectives of the Act are reflected in the SEO for Climatic Factors.
Climate Change (Northern Ireland) Act 2022	Sets a legal requirement to reduce NI's emissions of GHGs by 100% relative to 1990 levels by 2050.	• Target of an at least 100% reduction in net zero greenhouse gas (GHG) emissions by 2050 (i.e., net zero emissions by 2050) for Northern Ireland compared to baseline; • Target of at least 48% reduction in net emissions by 2030. • Raised the commitment for renewable electricity consumption from 70% as established in the NI Energy Strategy to 80% by 2030.	The draft TDPNI should aim to contribute towards climate change mitigation. The Plan can contribute towards achieving renewable energy targets through connection of renewable generators to the electricity system. Environmental Protection Objectives of the Act are reflected in the SEO for Climatic Factors.
UK Climate Change Risk Assessment (CCRA) Programme 2022	The UK Government is required, under the Climate Change Act, to publish a CCRA every 5 years, setting out the risks and opportunities facing the UK from climate change.	The first CCRA was published by the Department for Environment, Food and Rural Affairs (Defra) in 2012, second in 2017 and third in 2022. These assessments identify the risk and opportunities posed by climate change over the next 5 years. Evidence Reports feed into the UK National Adaptation Programme, and national adaptation programmes of devolved administrations (i.e., the NICCAP2).	The draft TDPNI should aim to contribute towards climate change adaptation. The Plan can contribute towards achieving renewable energy targets through connection of renewable generators to the electricity system. Environmental Protection Objectives are reflected in SEOs for Climatic Factors.
(RoI) National Adaptation Framework 2018	The National Adaption Framework (NAF) was developed under the Climate Action and Low Carbon Development Act 2015 and sets out the national strategy to reduce the vulnerability of the Republic of Ireland to the negative effects of climate change and to avail of any positive impacts.	Key actions under the NAF include: • Putting in place revised governance and reporting arrangements. • Formalising the status of existing guidelines. • Formalising long term operational support for key sectors. • Facilitating the establishment of regional local authority climate action offices.	The draft TDPNI should aim to contribute towards climate change mitigation and infrastructure to be planned for and resilient to climatic change.

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		• Increasing awareness around climate adaption and resilience. • Integrating climate adaption into key national plans and policies.	
(RoI) Climate Action Plan 2023 (CAP23)	CAP23 is the second annual update to Ireland's Climate Action Plan 2019. It implements the carbon budgets and sectoral emissions ceilings introduced in 2022 ad sets the roadmap for taking action to halve emissions by 2030 and reach net zero emissions no later than 2050.	• Identifies the nature and scale of the challenge, outlining the current situation across key sectors such as Electricity, Transport, Built Environment, Industry and Agriculture. • The supplementary Annex of Actions provides the specific actions required to implement the targets set out in the Plan.	The draft TDPNI should aim to contribute towards climate change mitigation and infrastructure to be planned for and resilient to climatic change.
(RoI) National Energy and Climate Plan 2021-2030	The Plan outlines Irelands energy and climate policies in detail for the period from 2021 to 2030 and looks onwards to 2050. The NECP is a consolidated plan which brings together energy and climate planning into a single process for the first time.	• The 2019 NECP was prepared to incorporate all planned policies and measures that were identified up to the end of 2019, and which collectively deliver a 30% reduction by 2030 in non-ETS greenhouse gas emissions (from 2005 levels). • The Plan considered energy and climate policies levels of demographic and economic growth identified in the Project 2040 process and included all of the climate and energy measures set out in the National Development Plan 2018-2027. • Under the Programme for Government, Our Shared Future, Ireland is committed to achieving a 7% annual average reduction in greenhouse gas emissions between 2021 and 2030. The NECP was drafted in line with the current EU effort-sharing approach, before the Government committed to this higher level of ambition, and therefore does not reflect this higher commitment. Ireland is currently developing those policies and measures and intends to integrate the revision of the NECP into the process which	The draft TDPNI should aim to contribute towards climate change mitigation and infrastructure to be planned for and resilient to climatic change.

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		will be required for increasing the overall EU contribution under the Paris Agreement.	
The National Emissions Ceiling Regulations 2018	Implement in the UK Directive 2016/2284/EU relating to national emission ceilings for certain atmospheric pollutants.	The Regulations require: • Preparation of an annual inventory of emissions of certain pollutants occurring in the UK, and projections of such emissions. • Ensure from 2010-2019 that anthropogenic emissions of sulphur dioxide, nitrogen oxides, VOCs and ammonia occurring within the UK do not exceed specified amounts. • Ensure from 2020-2029 that anthropogenic emissions of sulphur dioxide, nitrogen oxides, VOCs, ammonia and fine particulate matter occurring within the UK do not exceed specified amounts, and from 2030 that they do not exceed additional specified amounts. • Ensure emissions in 2025 are following a linear reduction trajectory between 2020 and 2030 targets. • Preparation of a national air pollution control programme, to which public authorities must have regard. • Locate sites representative of specified ecosystems and habitats in order to monitor the negative impacts of air pollution.	The draft TDPNI should have regard for the environmental protection objectives of the Regulations. The plan should aim to not cause any negative impacts on air quality that could breach standards and objectives and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system. These environmental protection objectives are reflected in the SEOs for Air Quality and Climatic Factors.
UK National Air Pollution Control Programme (NAPCP) 2023	Programme required under The National Emission Ceilings Regulations 2018. The NAPCP sets out how the UK can meet the legally binding 2020 and 2030 emission reduction commitments.	• Emission reduction commitments apply for 5 pollutants: nitrogen oxides, ammonia, non-methane VOCs, particulate matter and sulphur dioxide.	The draft TDPNI should have regard for the environmental protection objectives of the Programme. The plan should aim to not cause any negative impacts on air quality and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
			Environmental Protection Objectives are reflected in the SEOs for Air Quality and Climatic factors.
The Environment Act 2021 and The Environment (2021 Act) (Commencement and Saving Provision) Order (Northern Ireland) 2022	This legislation acts as the UK's new framework of environmental protection. It provides the Government with powers to set new binding targets, including for air quality, water, biodiversity, and waste reduction.	• Establishes the Office for Environmental Protection as a new environmental watchdog. • Sets the priority areas as air quality, water, biodiversity, and resource efficiency and waste reduction. • Established a legally binding duty on Government to bring forward at least two new air quality targets in secondary legislation.	The draft TDPNI should have regard for the environmental protection objectives of this legislation. The plan should aim to not cause any negative impacts on air quality, water, biodiversity and waste, and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system.
Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (due to be amended / updated in May 2023)	The Air Quality Strategy sets out air quality objectives and policy options to improve air quality in the UK from current to long term. As well as direct benefits to human health, these options are intended to provide important benefits to quality of life and to help protect the environment.	The Strategy sets out the UK Government and devolved administrations' air quality objective and the measures selected to achieve desired improvements in air quality. The overall aim is a steady decrease in ambient levels of pollutants towards the objectives over the period of implementation. These objectives are a statement of policy intentions or targets and are not legally binding in themselves. The main sources, hazards and strategy's objectives are provided for the following pollutants: particulate matter, oxides of nitrogen, ozone, sulphur dioxide, polycyclic aromatic hydrocarbons, benzene, 1,3-butadiene, carbon monoxide, lead and ammonia.	The draft TDPNI should have regard for the environmental protection objectives of the Strategy. The plan should aim to not cause any negative impacts on air quality and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system. These environmental protection objectives are reflected in the SEOs for Air Quality and Climatic Factors.
Air Quality Standards Regulations (Northern Ireland) 2010, and amendments (2017)	Transpose the EU Air Quality Directives and place a duty on the NI government departments to monitor levels of air pollutants specified in the Air Quality Directives and ensure compliance with limit values for these pollutants.	Designate zones in which ambient air will be protected by limiting the concentration of pollutants within them.	The draft TDPNI should have regard for the environmental protection objectives of the Strategy. The plan should aim to not cause any negative impacts on air quality and may be able to contribute to

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
			reducing air emissions by connecting renewable energy generators to the system. These environmental protection objectives are reflected in the SEOs for Air Quality.
The Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013, and amendments up to 2018	Transpose Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control).	The Regulations revoked 18 sets of previous regulations relating to industrial emissions and consolidated all the provisions of the Industrial Emissions Directive into a single set of regulations. They control the operation of any installation or mobile plant that carries out activities listed in Part 1 of Schedule 1 to the Regulations.	The draft TDPNI should have regard for the environmental protection objectives of the Regulations. The plan should aim to not cause any negative impacts on air quality and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system. These environmental protection objectives are reflected in the SEOs for Air Quality and Climatic Factors.
Clean Air Strategy for Northern Ireland – A Public Discussion Document, 2020	Discussion document in advance of developing the first Clean Air Strategy for Northern Ireland.	Presents evidence and research on a range of ambient air pollutants and outline policy and legislation currently in place to control air pollution.	The draft TDPNI should have regard for Environmental Protection Objectives of this Strategy. The plan should aim to not cause any negative impacts on air quality and may be able to contribute to reducing air emissions by connecting renewable energy generators to the system.
Sustainable Development			
Northern Ireland Energy Strategy – the Path to Net Zero (2021)	Energy accounts for almost 60% of Northern Ireland's GHG emissions. The Strategy sets out a pathway for energy to 2030 that aims to mobilise the skills, technologies and behaviours needed to take Northern Ireland towards the vision of net zero carbon and affordable energy by 2050.	The Strategy set the following targets to drive the desired changes: • Energy Efficiency – Deliver energy savings of 25% from buildings and industry by 2030. • Renewables – Meet at least 70% of electricity consumption from a diverse mix of renewable sources by 2030.	The draft TDPNI has a key role to play in furthering the ambitions set out in the Energy Strategy.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• Green Economy – Double the size of our low carbon and renewable energy economy to a turnover of more than £2 billion by 2030.	
Energy Strategy for Northern Ireland – the Path to Net Zero Energy. Action Plan (2022)	The Action Plan sets out the actions that are considered necessary to achieve the targets of the Energy Strategy.		The draft TDPNI has a key role to play in furthering the ambitions set out in the Energy Strategy.
Draft Offshore Renewable Energy Action Plan (OREAP) 2022	The draft plan is the first step towards delivering on the ambition of deploying 1 Gigawatt (GW) of offshore wind from 2030 in Northern Ireland's waters. The Energy Strategy included Action 14 to "Develop an action plan to deliver 1GW of offshore wind from 2030". It is designed to accelerate the Energy Strategy ambition, setting the pathway to achieving the deployment of offshore wind in advance of 2030, if feasibly possible.	Developed with three key principles: • Sustainable development in the marine environment. • Adaptive approach. • Collaboration and partnership. Developed around five themes: • Sustainability and co-existence. • Enabling frameworks. • Electricity network. • Economic growth. • Legislation and regulation. Sets out 12 key objectives within the five strategic priority themes. Within these key objectives, sets out 22 actions – initial delivery steps towards ensuring policy direction is established and any necessary legislation is brought forward.	The draft TDPNI should have consideration for this plan, as it identifies the offshore renewable energy for which SONI may be required to provide transmission infrastructure.
(RoI) Offshore Renewable Energy Development Plan (OREDP) 2014, and draft OREDP II	The OREDP is a plan that identifies the opportunity for the sustainable development of Ireland's abundant offshore renewable energy resources for increasing indigenous production of renewable electricity, thereby contributing to reductions in greenhouse gas emissions. The draft OREDP II provides an updated assessment of this resource.	The OREDP was based on the following: • Ireland is obliged to reach a target of 16% of all energy consumed in the State coming from renewable sources by 2020. • This obligation is to be met by 10% in transport, 12% from heat and 40% from electricity.	The draft TDPNI should have consideration for this plan, as it identifies the opportunity for offshore renewable energy for which may have transboundary impacts on SONI strategic planning.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		The OREDP II considers advances in technology to assess the offshore renewable energy potential in Irish waters and seek to map areas most suitable for offshore renewable energy, and assist in delivering the PfG commitment to develop a long-term plan to take advantage of a potential of at least 30GW of floating wind off the Atlantic coast.	
A Green Future: Our 25 Year Plan to Improve the Environment 2018	This is a 25-year plan to improve the Environment. This environment plan sets out our goals for improving the environment within a generation and leaving it in a better state than we found it. It details how we in government will work with communities and businesses to do this.	The targets of the plan are: • Clean air • Clean and plentiful water • Thriving plants and wildlife • Reducing the risks of harm from environmental hazards • Using resources from nature more sustainably and efficiently • Enhancing beauty, heritage and engagement with the natural environment • Mitigating and adapting to climate change • Minimising waste • Managing exposure to chemicals • Enhancing biosecurity	The draft TDPNI should promote sustainable management of the environment by carefully considering current land use and future climate scenarios, to facilitate long term improvements in the environment.
Draft Environment Strategy for Northern Ireland 2022	The draft Environment Strategy sets out Northern Ireland's environmental priorities for the coming decades and forms part of the Executive's Green Growth Delivery Framework. It will be used to form the basis for a coherent and effective set of interventions that can deliver real improvements in the quality of the environment.	Aims to reduce water pollution and become the overarching strategy which supports Northern Ireland's environment. There are our possible environmental themes set out: Engagement; Prosperity; Efficiency; and Quality/ Covers the following areas: • Climate change • Natural environment and landscapes • Resource efficiency • Marine environment • Environmental Quality (Air, Water and Neighbourhood) • Fisheries and Aquaculture	The draft TDPNI should have regard for Environmental Protection Objectives of this Strategy in the development and operation of transmission infrastructure.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• Built environment	
Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004	Implements the SEA Directive (2001/42/EC) in Northern Ireland. To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development.	See SEA Directive.	The draft TDPNI will be subject to the SEA process. This is being undertaken through this Scoping Report and subsequent Environmental Report.
The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017	Implement the EIA Directive in Northern Ireland in respect of the planning system.	• Contain procedures to facilitate the preparation of environmental statements and the provision of information relevant to their preparation and sets out the minimum content and requirements when preparing an environmental statement. • Ensure that environmental impact assessment (EIA) development cannot be permitted without the consideration of environmental information, describe the EIA process and set out the matters that confirm that development is EIA development.	The draft TDPNI will have regard to these EIA Regulations in the development of any infrastructure. Development and operation of certain transmission development projects included in the TDPNI may be subject to EIA.
Northern Ireland Executive Programme for Government 2016-2021	The Programme for Government identifies the actions the Executive stated purpose – Improve wellbeing for all – by tackling disadvantage and driving economic growth.	List of Programme for Government Outcomes • We prosper through a strong, competitive, regionally balanced economy. • We live and work sustainably - protecting the environment. • We have a more equal society. • We enjoy long, healthy, active lives. • We are an innovative, creative society where people can fulfil their potential. • We have more people working in better jobs. • We have a safe community where we respect the law and each other.	The draft TDPNI will have regard to this programme and will (in combination with other users and bodies) aim to cumulatively contribute towards the achievement of the objectives of this programme.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• We care for others and we help those in need. • We are a shared, welcoming and confident society that respects diversity. • We have created a place where people want to live and work, to visit and invest. • We connect people and opportunities through our infrastructure. • We give our children and young people the best start in life.	
Programme for Government Draft Outcomes Framework 2021	The Northern Ireland Executive is currently developing a new strategic, outcomes-based Programme for Government. Two of the key outcomes in the draft PfG that are most relevant to the draft TDPNI are: 'an economy that is globally competitive, regionally balanced and carbon neutral'; and 'that we live and work sustainably – protecting the environment'.		The draft TDPNI will have regard to this programme and will (in combination with other users and bodies) aim to cumulatively contribute towards the achievement of the objectives of this programme.
Strategic Planning Policy Statement for Northern Ireland 2015	This planning policy sets out the Department's regional planning policies for securing the orderly and consistent development of land in Northern Ireland under the reformed two-tier planning system. The provisions of the SPPS must be taken into account in the preparation of Local Development Plans and are also material to all decisions on individual planning applications and appeals.	There are two new Core Planning Principles included in the SPPS: • Supporting Sustainable Economic Growth, and • 'Preserving and Improving the Built and Natural Environment	The draft TDPNI will have consideration for these planning policies in the development and operation of transmission infrastructure.
Planning Policy Statements 1 – 23	Policies on land-use and other planning matters that apply to the whole of Northern Ireland.	PPS1: General Principles- Sets out the general principles that the DoENI observes in carrying out its planning functions. PPS2: Natural Heritage- Sets out the Department's planning policies for the conservation, protection and enhancement of our natural heritage,	The draft TDPNI should have consideration for these planning policies in strategic and detailed planning for transmission infrastructure.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		PPS4: Planning and Economic Development- Sets out the Department's revised planning policies for economic development uses and indicates how growth associated with such uses can be accommodated and promoted in development plans. PPS6: Planning, Archaeology and the Built Heritage- Provides the main criteria in assessing proposals which affect the archaeological or built heritage. PPS15: Planning and Flood Risk- The main objectives are to: Adopt a precautionary approach to decision-making taking account of climate change so that risk is avoided where possible; PPS18: Renewable Energy- Sets out the planning policy for development that generates energy from renewable resources. PPS21: Sustainable Development in the Countryside- sets out planning policies for development in the countryside.	
The Regional Development Strategy 2035 – Shaping Our Future Updates the Regional Development Strategy for Northern Ireland 2025	The strategy aims to take account of the economic ambitions and needs of the Region, and put in place spatial planning, transport and housing priorities that will support and enable the aspirations of the Region to be met.	The over-arching vision of the Regional Development Strategy is: “An outward-looking, dynamic and liveable Region with a strong sense of its place in the wider world; a Region of opportunity where people enjoy living and working in a healthy environment which embraces the quality of their lives and where diversity is a source of strength rather than division. “ The aims of the RDS 2025 remain valid: • Support strong, sustainable growth for the benefit of all parts of Northern Ireland. • Strengthen Belfast as the regional economic driver and Londonderry as the principal city of the North West.	The draft TDPNI will consider land use changes and spatial planning impacts in the development and operation of transmission infrastructure.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• Support our towns, villages and rural communities to maximise their potential. • Promote development which improves the health and well-being of communities. • Improve connectivity to enhance the movement of people, goods, energy and information between places. • Protect and enhance the environment. • Take actions to reduce our carbon footprint and facilitate adaptation to climate change. • Strengthen links between north and south, east and west, with Europe and the rest of the world.	
(RoI) National Planning Framework (Project Ireland 2040)	A national document that will guide, at a high-level, strategic planning and development for Ireland over the next 20+ years, so that as the population grows, that growth is sustainable.	The ultimate objectives of the National Planning Framework (NPF) are to: • Guide the future development of Ireland, taking into account a projected 1 million increase in population, the need to create 660,000 additional jobs to achieve full employment and a need for 550,000 more homes by 2040; • Of the 1 million extra people: - 25% is planned for Dublin, recognised as a key international and global city of scale and principal economic driver, - 25% across the other four cities combined (Cork, Limerick, Galway and Waterford), enabling all four to grow their population and jobs by 50-60% and become cities of greater scale, i.e., growing by twice as much as they did over the previous 25 years to 2016, and - With the remaining 50% of growth to occur in key regional centres, towns, villages and rural areas, to be	The draft TDPNI should have regard for this Framework by considering the potential transboundary impacts from the development of transmission infrastructure and promoting sustainable development.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		determined in the forthcoming regional plans. • Enable people to live closer to where they work, moving away from the current unsustainable trends of increased commuting; • Regenerate rural Ireland by promoting environmentally sustainable growth patterns; • Plan for and implement a better distribution of regional growth, in terms of jobs and prosperity; • Transform settlements of all sizes, through imaginative urban regeneration and bring life / jobs back into cities, towns and villages; • Co-ordinate delivery of infrastructure and services in tandem with growth, through joined up NPF/National Investment Plan and consistent sectoral plans, which will help to manage this growth and tackle congestion and quality of life issues in Dublin and elsewhere.	
UK Sustainable Development Strategy, Agenda 21	The strategy aims to take account of the economic ambitions and needs of the Region, and put in place spatial planning, transport and housing priorities that will support and enable the aspirations of the Region to be met.	The over-arching vision of the Regional Development Strategy is: "An outward-looking, dynamic and liveable Region with a strong sense of its place in the wider world; a Region of opportunity where people enjoy living and working in a healthy environment which embraces the quality of their lives and where diversity is a source of strength rather than division. " The aims of the RDS 2025 remain valid: • Support strong, sustainable growth for the benefit of all parts of Northern Ireland	The draft TDPNI should have regard for the environmental protection objectives of the Strategy in the development and operation of transmission infrastructure.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• Strengthen Belfast as the regional economic driver and Londonderry as the principal city of the North West • Support our towns, villages and rural communities to maximise their potential • Promote development which improves the health and well-being of communities • Improve connectivity to enhance the movement of people, goods, energy and information between places • Protect and enhance the environment • Take actions to reduce our carbon footprint and facilitate adaptation to climate change • Strengthen links between north and south, east and west, with Europe and the rest of the world.	
10X Economy – An Economic Vision	In May 2021, the Department for the Economy launched its economic vision for the next 10 years, called 10x Economy - an economic vision for a decade of innovation.	The concept embraces innovation to deliver a ten times (10X) better economy with benefits for all the people of Northern Ireland. Ten guiding principles have been identified to underpin this vision and a number of these are relevant to the energy sector, such as delivering positive economic, environmental and societal outcomes; supporting a greener, sustainable economy; position Northern Ireland amongst the most competitive small, advanced economies in the world; and focussing on increasing innovation in high value-added areas and priority clusters.	The draft TDPNI should have regard for the environmental protection objectives of the vision in the development and operation of transmission infrastructure.
Draft Green Growth Strategy for Northern Ireland– Balancing our Climate, Environment and Economy 2021	Green Growth is an over-arching multi-decade Strategy, led by DAERA, which sets out the long-term vision and a solid framework for tackling the climate crisis by balancing climate action with the need for a clean, resilient environment and economy. It has been developed by all Ministers and Government departments working together,	The cross-cutting strategy will be delivered through a series of Climate Action Plans, which will set out the actions to meet sector-specific greenhouse gas emission targets to deliver a cleaner environment rich in biodiversity; delivering a more efficient use of	The draft TDPNI should aim to contribute towards climate change mitigation. The Plan can contribute towards achieving GHG emission reduction targets through connection of renewable generators to the electricity system.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
	in collaboration with external stakeholders from local government, the private sector, voluntary and community sectors and others.	resources within a circular economy; and green jobs.	
Draft Rural Policy Framework for Northern Ireland 2021	The overall aim of the policy framework is to create a sustainable rural community where people want to live, work and be active.	The framework comprises five key thematic pillars, and nineteen associated priority interventions. The thematic pillars are: • Innovation and entrepreneurship; • Sustainable tourism; • Health and wellbeing; • Employment; and • Connectivity	The draft TDPNI will look to support the framework through provision of robust and reliable transmission infrastructure to meet the electrical supply and demand requirements in Northern Ireland.
Shaping Our Electricity Future Roadmap. Version 1.1, 2023	The grid requires unprecedented change up to 2030. The main objective of this Roadmap is to outline how the grid can be made ready so that 80% of Ireland's and Northern Ireland's electricity can come from renewable sources by 2030.	The targets for renewable energy are the product of updates to climate change policies in 2022. To achieve these targets by 2030, more energy from renewable sources needs to be connected to the power system. This means that the electricity grid will need to carry more power from energy sources that vary depending on the weather. This power will also need to be carried over longer distances. As a result, the grid needs to be made stronger and more flexible. This Roadmap outlines the changes needed to do that.	The draft TDPNI will have regard for, and support the objectives of this Roadmap.
(ROI) Grid Implementation Plan 2017-2022 for the Electricity Transmission System in Ireland	Identifies those parts of the transmission system that are likely to need development over the five-year period (2017 – 2022). The plan also sets out EirGrid's approach to the planning and development of the grid that will be undertaken in implementing the Grid Development Strategy.	Several policies and objectives have been developed for the Grid Implementation Plan to provide sustainable transmission grid development, under the headings: • Environmental • Technical • Project development • Consenting • Consultation and engagement, and • Human beings and society	The draft TDPNI will have regard to this plan and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives. This Plan will have transboundary implications with the TDPNI. The TDPNI and EirGrid Transmission Plans should work together for the all-island electricity system. The SONI TDPNI policies and objectives align well with the draft Grid IP policies and objectives.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
(ROI) Draft Grid Implementation Plan 2023-2028 for the Electricity Transmission System in Ireland	Identifies those parts of the transmission system that are likely to need development over the five-year period (2023 – 2028). The plan also sets out EirGrid's approach to the planning and development of the grid that will be undertaken in implementing the Grid Development Strategy.	As for Grid Implementation Plan 2017-2022.	As for Grid Implementation Plan 2017-2022.
(ROI) Draft Transmission Development Plan 2023 – 2032. Eirgrid.	Plan for the development of the Irish electricity transmission network and interconnection over the ten-year period 2023-2032.	The TDP describes Eirgrid's development planning process, discusses the drivers and assumptions underlying the plan, and outlines the TSO's plans for transmission network development over the next ten years, including projects under construction.	The draft TDPNI will have regard to this plan and will (in combination with other users and bodies) cumulatively contribute towards the achievement of its objectives. This Plan will have transboundary implications with the TDPNI. The TDPNI and EirGrid Transmission Plans should work together for the all-island electricity system.
National Planning Framework (2018)	National document guiding strategic terrestrial planning and development for Ireland over the next 20 plus years.	Together with the National Development Plan (NDP) 2018-2027, sets the context for each of Ireland's three regional assemblies to develop their Regional Spatial and Economic Strategies (RSES), taking account of and coordinating local authority County and City Development Plans in a manner that ensures national, regional and local plans align. Sets out a high-level vision to shape the future growth and development of Ireland to 2040, expressed as ten National Strategic Outcomes (NSO) a shared set of national goals and benefits that the plan can deliver if implemented according to the identified National Policy Objectives (NPO).	The draft TDPNI should have consideration for this planning framework and its objectives.
Water			
Water Environment (Floods Directive) Regulations (Northern Ireland) 2009,	Implement EU Floods Directive 2007/60/EC on the risk and management of flood risk in Northern Ireland.	Main purpose is to establish a framework for the assessment of adverse consequences of	The draft TDPNI should have regard for the environmental protection objectives

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
and amendment Regulations 2018		flooding on human health, the environment, cultural heritage and economic activity.	of the Floods Regulations in the planning of transmission infrastructure. The TDPNI should consider the implications of the flood risk arising from development options, particularly those located along the coast or in the vicinity of rivers. Environmental protection objectives of the Directive are reflected in the SEOs for Water.
The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017	Transpose the Water Framework Directive (2000/60/EC) into NI legislation.	• Place a responsibility on NI to try to ensure that all inland and coastal waters reach at least “good status” (or good ecological potential for artificial or heavily modified water bodies); • Implementation of management planning at river basin level, to achieve this target, linking with other key policy areas such as agriculture, land use, biodiversity, tourism and flood protection through a river basin management plan (RBMP). This sets out a programme of measures to be implemented over 6-year cycles aimed at improving water body status.	The draft TDPNI should have regard for the environmental protection objectives of the WFD in the planning of transmission infrastructure. It will need to consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims. Environmental protection objectives of the Directive are reflected in the SEOs for Water.
UK Marine Strategy Regulations 2010	Require the UK to take the necessary measures to achieve or maintain Good Environmental Status(GES) through the development of a UK Marine Strategy.	• The UK Marine Strategy, made up of Parts One, Two and Three, sets out a comprehensive framework for assessing, monitoring and taking action across our seas to achieve the UK’s shared vision for ‘clean, healthy, safe, productive and biologically diverse ocean and seas’.	The draft TDPNI should have regard for the environmental protection objectives of the Marine Strategy in the planning of transmission infrastructure. It will need to consider the requirements of the Strategy and ensure that it does not compromise its objectives, and that it contributes to achieving its aims. Environmental protection objectives of the Strategy are reflected in the SEOs for Water.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015	Transpose Directive 2013/39/EU which revised environmental standards for some priority substances and added a further twelve additional substances to the list of priority substances introduced by the original Priority Substances Directive (2008/105/EC). Consolidate all the current legislation which set out the Water Framework Classification Schemes.	• Consolidate all the current legislation which set out the Water Framework Classification Schemes. • Sets environmental quality standards for priority substances. • Outlines standards required for Shellfish waters.	The draft TDPNI should have regard for the environmental protection objectives of the WFD in the planning of transmission infrastructure. It will need to consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims. Environmental protection objectives of the Directive are reflected in the SEOs for Water.
The Quality of Bathing Water Regulations (Northern Ireland) 2008	These Regulations set quality standards for bathing water.	• Require regular testing of bathing waters, to ensure that they are of high enough quality for the general public to bathe in; • Require a Profile to be prepared for each designated bathing water site, giving detailed information on the physical characteristics and assessing the pollution risk to each site • Set quality standards for a number of issues, the most important of which relate to coliform and streptococcal groups of bacteria, which can indicate the mount of sewage or other faecal contaminants present.	The draft TDPNI should have regard for the environmental protection objectives of these Regulations in the planning of transmission infrastructure, relating to the potential for cumulative effects on waters used for recreation. Development and operation of electrical transmission infrastructure should not negatively impact on designated bathing waters
Private Water Supplies Regulations (Northern Ireland) 2017	Protection from contamination of water used for human consumption.	Aim to protect human health from the adverse effects of any contamination of water intended for human consumption from private supplies by ensuring that the water meets water quality standards and revoke and replace the 2009 Regulations (as amended).	The draft TDPNI may have implications for waters used as a drinking water supply. The draft TDPNI should have regard for the environmental protection objectives of these Regulation in the planning of transmission infrastructure. Development and operation of electrical transmission infrastructure should not negatively impact on designated drinking waters

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
Water Supply (Water Quality) Regulations (Northern Ireland) 2017	Protection from contamination of water used for human consumption.	Aim to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that the water meets water quality standards within the public water supply and revoke and replace the 2007 regulations (as amended).	The draft TDPNI may have implications for waters used as a drinking water supply. The draft TDPNI should have regard for the environmental protection objectives of these Regulations in the planning of transmission infrastructure. Development and operation of electrical transmission infrastructure should not negatively impact on designated drinking waters
Environmental Liability (Prevention and Remediation) Regulations 2009 and amendment	Implement the Environmental Liability Directive (2004/35/EC) in Northern Ireland.	• Brings into force rules to force polluters to prevent and repair damage to water systems, land quality, species and their habitats and protected sites. • The polluter does not have to be prosecuted first, so remedying the damage should be faster.	The draft TDPNI will be obliged to comply with the requirements of the Regulations and to prevent environmental damage. Development and operation of electrical transmission infrastructure should aim to cause no damage to the wider environment.
Groundwater Regulations (Northern Ireland) 2009 and amendments	Protection of groundwater from pollution.	Introduces classification systems in line with EU developments, makes it an offence to discharge listed substances without an authorisation, controls issuing and reviewing authorisations and consents. Covers enforcement, codes of practice and penalties.	The draft TDPNI should have regard for the environmental protection objectives of these Regulations in the planning of transmission infrastructure. The TDPNI should, where possible, contribute to the protection of groundwater from point source and diffuse pollution that could be caused or exacerbated by development options
Pollution Control and Local Government (Northern Ireland) Order 1978		Regulates waste on land, abandoned vehicles, noise nuisance, noise abatement zones, sulphur content of oil fuel used in furnaces and engines, cable burning, and pollution of the atmosphere and water. Other aspects have been revoked.	The draft TDPNI should have regard for the environmental protection objectives of this Order. Development and operation of electrical transmission infrastructure should aim to cause no damage to the wider environment.

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Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006 and amendment Regulations 2007	Sets out a control regime for regulating the abstraction of water from underground strata and waterways and for constructing, altering or operating impounding works.		The draft TDPNI should have regard for the environmental protection objectives of these Regulations in the development and operation of transmission infrastructure.
Water (Northern Ireland) Order 1999 (including amendments up to 2004)	Revokes and replaces the Water Act (Northern Ireland) 1972 and makes provision for discharge consents. Enables the DoE to set water quality objectives and prevent pollution from anti-pollution works.		The draft TDPNI should have regard for the environmental protection objectives of the Order, in terms of cumulative effects on surface water bodies.
NI Flood Risk Management Plan, 2021-2027	The NI Flood Risk Management Plan (FRMP) is a key requirement of the Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) and is aimed at reducing the potential adverse consequences of significant floods on human health, economic activity, cultural heritage and the environment.	The objectives set, in relation to each area of impact are: Economic Activity • To reduce the cost of potential future flood damages to properties and infrastructure; • To reduce the economic costs caused by disruption to essential infrastructure and services; and, • To optimise the economic return on flood risk management investment. Human Health and Social • To reduce the risk to life, health and wellbeing. • To increase awareness and understanding of flooding and its adverse consequences and improve community resilience. • To reduce the impact on people caused by the disruption to essential infrastructure and services. • To improve recreation and public amenities. Environmental • To consider the impact of Climate Change across all areas of impact;	The draft TDPNI should have regard for the environmental protection objectives of the FRMP in the planning of transmission infrastructure. The TDPNI should consider the implications of the flood risk arising from development options, particularly those located along the coast or in the vicinity of rivers. Environmental protection objectives of the FRMP are reflected in the SEOs for Water.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• To support the objectives of the Water Framework Directive and contribute to the achievement of good ecological potential/status for water bodies; • To protect and enhance the natural environment.	
Marine Act (NI) 2013	The Marine Act sets out a new framework for Northern Ireland's seas based on: a system of marine planning that will balance conservation, energy and resource needs; improved management for marine nature conservation and the streamlining of marine licensing for some electricity projects.	The Marine Act enables DAERA to prepare a marine plan for the inshore region and to designate areas as Marine Conservation Zones (MCZ).	The draft TDPNI should consider the implications of this Act with developmental infrastructure options within the plan that may impact on coastal and marine areas.
Marine and Coastal Access Act 2009	New Marine Licensing legislation came into operation in Northern Ireland on the 6th April 2011. It replaced licensing under the Food and Environment Protection Act 1985 (FEPA). The purpose of this licensing system is to aid industry and encourage investment by enabling more strategic decisions to be made about what activities are permissible in the marine environment. The overall objective of marine licensing is to regulate sustainable development in a cohesive and fair manner.	The key features of the new system include • The definition of marine licensable activities; • exempt activities; • fees and charges; • implementation of measures for sanctioning and enforcement; and] • making appeals against licensing decisions, statutory notices and monetary penalties.	The draft TDPNI should consider the implications of this Act with developmental infrastructure options within the plan that may impact on coastal and marine areas.
UK Marine Policy Statement 2011	The Marine Policy Statement (MPS) is the framework for preparing Marine Plans and taking decisions affecting the marine environment.	• Achieve integration between different objectives; • Recognise that the demand for use of our seas and the resulting pressures on them will continue to increase; • Manage competing demands on the marine area, taking an ecosystem-based approach; • Enable the co-existence of compatible activities wherever possible; and • Integrate with terrestrial planning.	The draft TDPNI will have to consider the policies of the MPS in the strategic planning for infrastructure options within the plan that may impact on marine areas. The MPS includes a number of high-level principles for decision making that should be taken into account, particularly in relation to those impacts associated with Section 2.6.7 Climate change adaptation and mitigation and

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
			Section 2.6.8 Coastal change and flooding.
Draft Marine Plan for Northern Ireland 2018	The Marine Plan for Northern Ireland will inform and guide the regulation, management, use and protection of our marine area. It is a single document made up of two plans, one for the inshore region and one for the offshore region. All public authorities are responsible for implementing the Plan through existing regulatory and decision-making processes. As well as public authorities, all applicants, third parties and advisors should also consider the Plan.	The Marine Plan will be used by Public Authorities in taking decisions which affect or might affect the marine area, including: • Authorisation or enforcement decisions • Decisions that relate to the exercise of any function capable of affecting the marine area.	The draft TDPNI will have to consider the policies of the Marine Plan in the strategic planning for infrastructure options within the plan that may impact on marine areas. Proposals should conform with all relevant policies, taking account of economic, environmental and social considerations.
Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026	The Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026 is based around 4 broad themes, consistent with the principles of sustainable development.	The Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026 is intended to set out long-term objectives for achieving sustainable coastal management, through improvements to existing management systems, the development of new management systems and identifying and dealing with potential areas of conflict.	The draft TDPNI will have to consider this strategy in the strategic planning for infrastructure options within the plan that may impact on coastal areas, with particular relevant to priority 2: safeguarding and improving the environment within the coastal zone and priority 4: integration of planning effort.
Draft 3rd cycle River Basin Management Plan (RBMP) for Northern Ireland 2021-2027	Describes existing condition of waters in the River Basin Districts, the objectives for improving their condition and the measures to be used to deliver these improvements. • Establish a framework for the protection of water bodies at River Basin District (RBD) level • Preserve, prevent the deterioration of water status and where necessary improve and maintain “good status” of water bodies in that RBD • Promote sustainable water usage	• Aims to improve water quality and quantity within inland surface waters (rivers and lakes), transitional waters coastal waters and groundwater and meet the environmental objectives outlined in Article 4 of the Water Framework Directive. • Identifies and manages water bodies in the RBD; • Establishes a programme of measures for monitoring and improving water quality in the RBD; • Involves the public through consultations;	The draft TDPNI should have regard for the environmental protection objectives of the RBMP in the planning of transmission infrastructure. It will need to consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims. Environmental Protection Objectives of the Plan are reflected in the SEO for Water.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• RBMPs are prepared and reviewed every six years. The most recent is the draft 3rd cycle RBMP, which runs from 2021-2027.	
(RoI) Draft River Basin Management Plan for Ireland 2022-2027	The plan is produced in implementation of the EU Water Framework Directive (WFD). It aims to achieve good water quality in Ireland's rivers, lakes, estuaries and seas.	• Aims to improve water quality and quantity within inland surface waters (rivers and lakes), transitional waters coastal waters and groundwater and meet the environmental objectives outlined in Article 4 of the Water Framework Directive. • Sets out the measures necessary to protect and improve the quality of waters. • Plans are prepared in 6-year cycles, during which a programme of measures must be implemented so as to achieve water quality objectives.	The draft TDPNI should have regard for the environmental protection objectives of the Republic of Ireland's RBMP in the planning of transmission infrastructure. It will need to consider the requirements of the WFD and ensure that it does not compromise its objectives, and that it contributes to achieving its aims.
(RoI) National Marine Planning Framework 2021	The National Marine Planning Framework (NMPF) brings together all marine-based human activities for the first time, outlining the government's vision, objectives and marine planning policies for each marine activity.	• Details how marine activities will interact with each other in an ocean space that is under increasing spatial pressure, ensuring the sustainable use of marine resources to 2040. • Intended as the marine equivalent to the National Planning Framework, enabling the Government to: • Set a clear direction for managing RoI seas. • Clarify objectives and priorities. • Direct decision makers, users, and stakeholders towards strategic, plan-led, and efficient use of RoI marine resources.	The draft TDPNI should have consideration for this planning framework and its objectives.
(RoI) Catchment Flood Risk Assessment and Management (CFRAM) Programme 2016	CFRAM aims to reduce and manage flood risk throughout Ireland. It delivers ore components of the National Flood Policy whilst also meeting the requirements of the EU Floods Directive.	• CFRAM has involved the following: • Preliminary flood risk assessment to identify areas of flood risk. • Flood hazard and risk mapping.	The draft TDPNI should have regard for the environmental protection objectives of the Programme in the planning of transmission infrastructure.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• Development of flood risk management options. • Preparation of Flood Risk Management Plans.	The TDPNI should consider the implications of the flood risk arising from development option that may have transboundary implications.
(RoI) National Water Resources Plan (NWRP; in prep) and Framework Plan 2021	The NWRP is Irish Water's plan to identify how they will provide a safe, sustainable, secure and reliable water supply to their customers for now and into the future whilst safeguarding the environment.	• The NWRP sets out how Irish Water will balance the supply and demand for drinking water over the short, medium and long term. It is a 25-year strategy to ensure that there is a safe, sustainable, secure and reliable drinking water supply for everyone. • As the first NWRP, plan preparation is in two phases, the combination of these becoming the final Plan: • Phase 1 was carried out in 2021 and the Framework Plan was adopted. • Phase 2 (in prep.) summaries the needs across the 535 individual water supplies and identifies the solutions to address these needs. Due to the large number of supplies in Ireland, Phase 2 will be delivered as four Regional Water Resources Plans.	The draft TDPNI should have regard for the environmental protection objectives of the Plan in the planning of transmission infrastructure.
Waste			
Northern Ireland Waste Management Strategy, 2012 (new Strategy under development 2023)	The Waste Management Strategy sets out in detail those proposed policies, including specific actions to be taken. Strategy development is a continuous process and the Waste Management Strategy for Northern Ireland is considered as a living document, requiring regular review and revision to ensure that it remains relevant and the policies and actions therein remain appropriate.	The proposals of this Strategy are as follows: • The development of a Waste Prevention Programme; • A new 60% recycling target for local authority collected municipal waste (LACMW); • The introduction of a statutory requirement on waste operators to provide specified data on commercial and industrial waste; • New and more challenging collection and recycling targets for packaging and WEEE;	The draft TDPNI should consider the implications of this Management Strategy with developmental infrastructure options within the Plan which are likely to result in waste being generated.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• The introduction of a landfill restriction on food waste; • The potential for the devolution of landfill tax; • The implementation of legislation on carrier bags; • The development of detailed proposals for an Environmental Better Regulation Bill.	
Draft Waste Management Plan for Northern Ireland 2019	The draft Waste Management Plan for Northern Ireland 2019 outlines how it will efficiently manage waste for the Councils it represents with the overall goal of creating a system that 'meets the region's needs and contributes towards economic and sustainable development'. Subject to review every five years the Plan details how NI will fulfil its statutory obligations under the EU Waste Framework Directive and The Waste and Contaminated Land (Northern Ireland) Order 1997.	• Updates the previous WMP (2013-2020) • Provides an overview of waste management in Northern Ireland and fulfils the requirements of Article 2 (mandatory requirements) of the Waste Framework Directive and other required content as set out in Schedule 3 to the Waste and Contaminated Land (NI) Order 1997.	The draft TDPNI should consider the implications of this plan with developmental infrastructure options within the Plan which are likely to result in waste being generated.
Waste and Contaminated Land (Northern Ireland) Order 1997 (including updates)	Sets out the waste management regime covering waste carrier registration and identifying and remedying contaminated land.		The draft TDPNI should have regard for the environmental protection objectives of this Order, in the planning and operation of transmission infrastructure.
Cultural Heritage			
Archaeology 2030 – A Strategic Approach for Northern Ireland	A review of the current position of archaeology in Northern Ireland, to develop a sector-wide, strategic approach, with recommendations for the future.	The overall vision of this strategy is: • By 2030, we want archaeology to be accessed and valued by as many people as possible, led by a sector which is healthy, resilient and connected. It sets the following priorities, with associated recommendations for their successful delivery: • Aim 1 – Archaeology on the ground. • Aim 2 – Understanding the past.	The draft TDPNI should have regard for the environmental protection objectives of this Strategy, in the planning and operation of transmission infrastructure. Environmental Protection Objectives of the Strategy are reflected in the SEO for Cultural Heritage.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
		• Aim 3 – Sustaining the historic environment. • Aim 4 – Engaging and enriching people's lives. • Aim 5 – Innovation, understanding and skills.	
Historic Monuments and Archaeological Objects (NI) Order 1995	The Order allows for Monuments to be protected by taking them into State Care, or by Scheduling, and also places restrictions on searching for archaeological material	The purpose of designation is to ensure that policies are created and action taken to: • Conserve or enhance the natural beauty or amenities of that area; • Conserve wildlife, historic objects or natural phenomena within it; • Promote its enjoyment by the public; and • Provide or maintain public access to it.	The draft TDPNI should have regard for the environmental protection objectives of this Order, in the planning and operation of transmission infrastructure. Environmental Protection Objectives of the Order are reflected in the SEO for Cultural Heritage.
Planning Act (NI) 2011	The principal piece of planning legislation in Northern Ireland. Underpinned the reform of the planning system. Transferred the majority of planning functions and decision-making responsibilities for local development plans, development management plus planning enforcement to councils.	• Defines functions of Department of the Environment with respect to development of land • Grant powers to the Department to make provision, by Regulations, for environmental effects consideration in relation to development planning permission • Provide with respect to the grant of mineral planning permission and aftercare conditions regarding land subject to mineral development • Provide for hazardous substances consent • Define powers of Councils or Department to issue Tree Preservation Orders and provides for preservation of trees or woodlands in general; and • Make provision for appeals.	Certain potential transmission development proposals in the draft TDPNI will need to comply with the provisions of this legislation.
The Regional Development Strategy 2035 – RG11	A description of the RDS is provided above.	RG11 of the RDS is to "Conserve, protect and where possible enhance, our built heritage and our natural environment".	The draft TDPNI will consider land use changes and spatial planning impacts in the development and operation of transmission infrastructure, including

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
			consideration of strategic policies of the RDS.
Conservation Principles guidance (DfC 2023)	Sets out the best practice approach to managing change in relation to the historic environment and heritage assets.	Part 1 'Conservation Principles' Guidance for the sustainable management of the historic environment in Northern Ireland' sets out the six key guiding conservation principles: • The historic environment is of value to us all. • Everyone should be able to participate in sustaining the historic environment. • Understanding the significance of heritage assets is vital. • Heritage assets shall be managed to sustain their significance. • Decisions about change shall be reasonable, transparent and consistent. • Documenting and learning from decisions is essential, It also explains how significance is central to conservation, how to assess it, and use it as a tool to manage change. Part 2 'Applying the Conservation Principles' Guidance for the sustainable management of the historic environment in Northern Ireland' sets out the different types of changes impacting a heritage asset. It explains how the conservation principles can guide decision making for each change, to achieve best conservation outcomes.	The draft TDPNI should have regard for the environmental protection objectives of this guidance, in the planning and operation of transmission infrastructure.
Landscape			
Nature conservation and Amenity Lands Order (NI 1985	Provides for designation of the finest landscape areas as either Areas of Outstanding Natural Beauty (AONB) or National Parks land and takes steps to manage them for both conservation and recreation.		The draft TDPNI should have regard for the environmental protection objectives of this Order, in the planning and operation of transmission infrastructure.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
			Environmental Protection Objectives of the Order are reflected in the SEOs for Biodiversity, Flora and Fauna; and Landscape and Visual Amenity.
Northern Ireland Regional Landscape Character Assessment 2016	Provides a regional framework and information upon on which to base plans at a more local level that might affect landscape character. Complements the Northern Ireland Landscape Character Assessment (NILCA).	Subdivided the countryside into 26 Regional Character Areas (RCAs), based upon information relating to people and place and the combinations of nature, culture and perception that contribute to local uniqueness.	The draft TDPNI should consider the type and sensitivity of landscapes in the planning and operation of transmission infrastructure.
Northern Ireland Regional Seascape Character Assessment 2014	Provides a regional framework and information upon on which to base plans at a more local level that might affect seascape character. Complements the Northern Ireland Landscape Character Assessment (NILCA) and Regional LCA.	Identified 24 Seascape Character Areas along the Northern Ireland coast, describing the key features and characteristics of each area, and relating these to neighbouring terrestrial LCAs.	The draft TDPNI should consider the type and sensitivity of seascapes in the planning and operation of transmission infrastructure.
(ROI) National Landscape Strategy for Ireland 2015-2025	Strategy for the provision of a framework for the protection of the many cultural, social, economic and environmental values embedded in the landscape.	• To be implemented by the State, working in co - operation with public authorities, stakeholders, communities and individuals. • Objectives include to establish and to implement, through a series of actions, policies aimed at understanding, managing, protecting and planning the landscape. • Sets out specific measures to integrate and embed landscape considerations in all sectors which influence the landscape and improve and enhance the quality of decision-making by those who have an impact on it.	The draft TDPNI should consider the potential transboundary impacts on landscape and visual amenity within Ireland, particularly in sensitive areas, from the development of transmission infrastructure.
Regional			
Local Biodiversity Action Plans (LBAPs)	Local Biodiversity Action Plans are a way of encouraging people to work together and deliver a programme of continuing action for biodiversity		The draft TDPNI should have regard for these plans and look for opportunities to

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the draft APP
	at a local level. They set out practical steps that aim to help protect biodiversity, enhance and improve biodiversity where possible, and promote biodiversity at a local level.		conserve, and, where possible, restore or enhance biodiversity. SEOs for Biodiversity, Flora and Fauna should contribute towards the Environmental Protection Objectives of LBAPs.
Local Development Plans / Draft Plan Strategies	Development Plans set out how an area should look in the future by deciding the type and scale of development and where building should be allowed. Each Council must prepare a development plan for their area in consultation with the local community.	When preparing a development plan the council should consider • The council's Community Plan, a long-term vision for the social, environmental and economic well-being of the area and its citizens; • The council's Statement of Community Involvement (SCI) which sets out who, how, where and when consultation and policy making is to take place; • The RDS 2035, as the spatial strategy for NI; • Planning Policy and guidance; and • A sustainability appraisal prepared by the council so that economic and social factors are considered alongside environmental factors when developing the plan.	The draft TDPNI should have regard to these plans / strategies in order to take into consideration the local community in transmission infrastructure development.

APPENDIX C

SEA Scoring Guidelines

Topic	Objective	Score	Score Description	Example of Effects
Biodiversity, Flora and Fauna	Preserve, protect, maintain and, where possible, enhance internationally protected species and habitats.	+3	Significant Positive Effects	Potential for increased protection for, or enhancement of, designated species / habitats within International / European designated sites (SACs, SPAs, Ramsar sites).
		+2	Moderate Positive Effects	Potential for increased protection for, or enhancement of, designated species / habitats within national designated sites (MCZs, ASSIs).
		+1	Slight Positive Effects	Potential for increased protection for, or enhancement of, species / habitats within local designated sites. Potential for increased protection for, or enhancement of, protected or priority species / habitats outside designated sites (Annex I habitats, Annex II species, NI Priority Habitats and Species).
		0	Neutral / No Effects	No potential for effects on species / habitats within international / European, national or local designated sites. No potential for effects on protected or priority species / habitats outside designated sites.
		-1	Slight Negative Effects	Potential for disturbance or damage to species / habitats within local designated sites. Potential for disturbance or damage to protected or priority species / habitats outside designated sites. Potential for short-term, temporary effects on national designated sites.
		-2	Moderate Negative Effects	Potential for long-term disturbance or damage to designated species / habitats within national designated sites. Potential for short-term, temporary effects on international designated sites.
		-3	Significant Negative Effects	Potential for long-term disturbance or damage to designated species / habitats within international designated sites.
Population and Human Health	Minimise the risk to, and provide benefit for, the community and human health	+3	Significant Positive Effects	Potential for the provision of new robust transmission infrastructure and significant improvements to transmission infrastructure. Causing no disturbance to areas of generally poor perceived health and / or social deprivation and minimal disturbance in the local area. Potential for a permanent, direct increase in employment opportunities, as a result of maintenance activities relating to new transmission infrastructure or a permanent, indirect increase in employment opportunities through impacts upon the supply chain.
		+2	Moderate Positive Effects	Potential for improvements to / enhancements of existing transmission infrastructure. Causing no disturbance to areas of generally poor perceived health and / or social deprivation and minimal disturbance in the local area. Potential for a temporary, direct increase in employment opportunities as a result of construction activities relating to new transmission infrastructure.
		+1	Slight Positive Effects	Potential for slight improvements to transmission infrastructure. Causing minimal disturbance in the local area. Potential for a temporary, direct increase in employment opportunities as a result of construction activities relating to new transmission infrastructure.
		0	Neutral / No Effects	No change in transmission infrastructure in the local area. No disruption or displacement of the local population. No impacts on areas of generally poor perceived health and / or social deprivation.
		-1	Slight Negative Effects	Potential for temporary disturbance, in low population density areas, and temporary disturbance impacts on human health and wellbeing, during development of infrastructure, e.g., traffic, noise, dust.

Topic	Objective	Score	Score Description	Example of Effects
		-2	Moderate Negative Effects	Potential for temporary disruption / displacement impacts in high-density population areas, or permanent disruption impacts in low density population areas during development and operation of transmission infrastructure. Potential for temporary disturbance impacts on human health in areas of generally poor perceived health and / or social deprivation, or permanent disturbance impacts on human health in areas of general good health / no social deprivation, from development of transmission infrastructure
		-3	Significant Negative Effects	Potential for permanent disruption or displacement impacts in high density population areas, during development and operation of transmission infrastructure. Potential for permanent disturbance impacts from development of significant infrastructure in areas of perceived poor health and / or social deprivation.
Geology, Soils and Land Use	Minimise damage to the function and quality of the soil resource in the study area in construction and operation of transmission infrastructure.	+3	Significant Positive Effects	Potential for increased protection for protected geological / geomorphological features within international designated sites (UNESCO Geoparks, WHSs).
		+2	Moderate Positive Effects	Potential for increased protection for protected geological / geomorphological features within national designated sites (ASSIs, MCZs).
		+1	Slight Positive Effects	Potential for increased protection of sensitive soil resources or land use.
		0	Neutral / No Effects	No effects on protected geological / geomorphological features within international or national designated sites (UNESCO Geoparks, ASSIs). No loss of, or damage to sensitive soils and land uses (e.g., peatlands, ancient woodland, commercial forestry, cultivated lands). No interaction with potentially hazardous soils / activities (e.g., PPC sites, mines, quarries, historically contaminated sites). No interaction with topographically difficult areas (e.g., steep slopes, uplands).
		-1	Slight Negative Effects	Potential for temporary damage and disruption to the function and quality of the soil resource of non-sensitive sites in the study area during the construction phase of the transmission infrastructure.
		-2	Moderate Negative Effects	Potential for temporary damage to sensitive soil resource, geology or land use, including protected geological / geomorphological features within national designated sites, or for permanent damage or disruption to non-sensitive soil resource, geology or land use in development and operation of transmission infrastructure.
		-3	Significant Negative Effects	Potential for permanent loss or damage to sensitive soils and / or land uses, including protected geological / geomorphological features within national designated sites, in development and operation of transmission infrastructure.
Water	Protect and enhance the state of the water environment.	+3	Significant Positive Effects	Potential for contribution to improvement of water body WFD status in development and operation of transmission infrastructure. Potential for contribution to improvement in the status of sensitive water bodies. Potential for contribution to improvement in the status of Marine Strategy Descriptors. Potential for development of significant, flood resilient, transmission infrastructure with limited interactions with medium probability flood extents.

Topic	Objective	Score	Score Description	Example of Effects
		+2	Moderate Positive Effects	Potential for contribution to improvement to water quality and / or resource in development and operation of transmission infrastructure. Decreased potential impediment to the achievement of waterbody objectives under the WFD or Good Environmental Status for Descriptors under the Marine Strategy. Potential for development of flood resilient transmission infrastructure with limited interactions with medium probability flood extents.
		+1	Slight Positive Effects	Potential for localised improvement of marine, coastal or transitional water quality. Minimal potential for deterioration of water status, quality or resource in development and operation of infrastructure by avoiding any direct interaction with water bodies. Potential for development of flood resilient transmission infrastructure with several interactions with medium probability flood extents.
		0	Neutral / No Effects	No potential for deterioration of water status, quality or resource in development and operation of infrastructure by avoiding any interaction or close proximity with water bodies.
		-1	Slight Negative Effects	Potential for temporary, negative impacts on the water quality and / or resource of water bodies within the study area from development and operation of transmission infrastructure. Potential for development of transmission infrastructure with several interactions with medium probability flood extents, some infrastructure resilient to flooding.
		-2	Moderate Negative Effects	Potential for permanent, or frequent adverse impacts on water quality and / or resource of waterbodies that interact with, or are in within proximity to, the development and operation of transmission infrastructure. Increased potential impediment to the achievement of water body objectives under the WFD, or Good Environmental Status for Descriptors under the Marine Strategy. Potential for development of transmission infrastructure with several interactions within medium probability flood extents, and infrastructure not resilient to flooding.
		-3	Significant Negative Effects	Potential for permanent, negative impacts and deterioration of the water status of waterbodies that interact or are within proximity to the development and operation of transmission infrastructure. Potential deterioration in the status of sensitive water bodies. Potential deterioration in the status of Marine Strategy Descriptors. Potential for development of transmission infrastructure mainly within medium probability flood extents, infrastructure not resilient to flooding.
Air	Minimise risk to local air quality and contribute to improving regional emissions.	+3	Significant Positive Effects	Potential to significantly contribute to renewable energy connection, with a significant indirect contribution to a reduction in fossil fuel use and potential for significant reductions in regional emissions.
		+2	Moderate Positive Effects	Potential to moderately contribute to renewable energy connection, with a moderate indirect contribution to a reduction in fossil fuel use and potential for moderate reductions in regional emissions and slight improvement to air quality.
		+1	Slight Positive Effects	No development in air quality sensitive areas. Potential to slightly contribute to renewable energy connection, with a slight indirect contribution to a reduction in fossil fuel use and potential for slight reductions in regional emissions.
		0	Neutral / No Effects	No development in air quality sensitive areas. No potential for direct or indirect air emissions.

Topic	Objective	Score	Score Description	Example of Effects
		-1	Slight Negative Effects	Potential for a temporary increase in local emissions and reduction in local air quality during the construction of transmission infrastructure. Non-sensitive receptors.
		-2	Moderate Negative Effects	Potential for temporary increase in emissions and reduction in air quality during the construction of significant transmission infrastructure. Sensitive receptors.
		-3	Significant Negative Effects	Potential for long-term, significant impacts on air quality in air quality sensitive areas. No new connections for renewable energy to the transmission grid so potential for permanent increases in regional emissions and permanent reductions in air quality.
Climatic Factors	Contribute to a reduction in GHG emissions from the energy supply sector in line with national commitments.	+3	Significant Positive Effects	Potential to significantly contribute to a reduction in regional GHG emissions through increased renewable energy connection and reduced fossil fuel power station activity. Potential for development of flood resilient transmission infrastructure with limited interactions with medium probability climate change flood extents.
		+2	Moderate Positive Effects	Potential to moderately contribute to a reduction in regional GHG emissions through increased renewable energy connection and reduced fossil fuel power station activity. Potential for development of flood resilient transmission infrastructure with limited interactions with medium probability climate change flood extents.
		+1	Slight Positive Effects	Potential to slightly contribute to a reduction in GHG emissions through increased renewable energy connection. Potential for development of flood resilient transmission infrastructure with several interactions with medium probability climate change flood extents
		0	Neutral / No Effects	No potential to contribute to an increase or reduction in GHG emissions. Minimal potential for development of transmission infrastructure within medium probability climate change flood extents, with all infrastructure resilient to flooding.
		-1	Slight Negative Effects	Potential for temporary increases in local GHG emissions during construction of transmission infrastructure. Temporary loss of GHG sequestering natural cover during construction of transmission infrastructure. Potential for development of transmission infrastructure with several interactions with medium probability climate change flood extents, some infrastructure resilient to flooding.
		-2	Moderate Negative Effects	Potential for permanent increases in local GHG emissions from development and operation of transmission infrastructure. Moderate loss of GHG sequestering natural cover during the construction of transmission infrastructure, which may re-establish. Potential for development of transmission infrastructure with several interactions within medium probability flood extents, and infrastructure not resilient to flooding.
		-3	Significant Negative Effects	Potential for permanent increases in regional GHG emissions from development and operation of transmission infrastructure. Permanent loss of GHG sequestering natural cover. Potential for development of transmission infrastructure mainly within medium probability flood extents, infrastructure not resilient to flooding.
	Provide new, robust offshore	+3	Significant Positive Effects	Potential for significant development of regional scale new electricity grid infrastructure, with minimal potential disruption to other assets and infrastructure. Potential for the enhancement of

Topic	Objective	Score	Score Description	Example of Effects
Material Assets and Infrastructure	renewable energy infrastructure with minimal disruption to other assets and infrastructure.			current or development of new assets with the increased supply of secure and reliable electricity provided.
		+2	Moderate Positive Effects	Potential for a moderate scale local or regional development of new and reinforced electricity grid infrastructure, with minimal potential disruption to other assets and infrastructure.
		+1	Slight Positive Effects	Potential for a small scale, local development of new and reinforced electricity grid infrastructure, with minimal potential disruption to other assets and infrastructure.
		0	Neutral / No Effects	Potential for a small scale, local development of new and reinforced electricity grid infrastructure, with potential disruption to other assets and infrastructure.
		-1	Slight Negative Effects	Potential for temporary, indirect disruption to other assets and infrastructure during construction of transmission infrastructure.
		-2	Moderate Negative Effects	Potential for moderate temporary or slight permanent disruption to other assets and infrastructure in development and operation of transmission infrastructure.
		-3	Significant Negative Effects	Potential for significant, permanent disruption or loss of other assets and infrastructure in development and operation of transmission infrastructure. No development of new transmission infrastructure.
Cultural, Architectural and Archaeological Heritage	Protect International, National and Local Heritage Designations, and their settings.	+3	Significant Positive Effects	Potential for preservation / restoration of a known international or nationally designated heritage feature within study area in development and operation of transmission infrastructure.
		+2	Moderate Positive Effects	Potential for preservation / restoration of a known locally designated heritage feature within study area in development and operation of transmission infrastructure. Potential for discovery of new heritage features.
		+1	Slight Positive Effects	Potential to avoid impacts on, or the setting of, known heritage features, in development and operation of transmission infrastructure.
		0	Neutral / No Effects	No impacts on known archaeological or architectural heritage features within study area.
		-1	Slight Negative Effects	Potential for temporary disturbance / damage to or negative impacts on the setting of a known locally designated heritage feature.
		-2	Moderate Negative Effects	Potential for permanent damage to / loss of a known locally designated heritage feature or temporary disturbance / damage or negative impacts on the setting of a known international or nationally designated heritage features.
		-3	Significant Negative Effects	Potential for permanent damage to / loss of known international or nationally designated heritage feature.
Landscape and Visual Amenity	Protect, and where possible enhance, the landscape and seascape character	+3	Significant Positive Effects	Minimal negative impacts to landscape / seascape and visual amenity, in areas with low sensitivity and few receptors in development and operation of infrastructure.
		+2	Moderate Positive Effects	Minimal negative impacts to landscape / seacape and visual amenity, in areas with low sensitivity or few receptors in development and operation of infrastructure.

Topic	Objective	Score	Score Description	Example of Effects
	and visual amenity of the Northern Ireland shoreline.	+1	Slight Positive Effects	Minimal negative impacts to landscape / seascape and visual amenity in areas with moderate sensitivity and / or moderate number of receptors in development and operation of infrastructure.
		0	Neutral / No Effects	No change to the landscape / seascape and visual amenity in the development and operation of transmission infrastructure. No development of transmission infrastructure.
		-1	Slight Negative Effects	Potential for temporary negative impacts on landscape / seascape and / or visual amenity on areas in the development and operation of transmission infrastructure.
		-2	Moderate Negative Effects	Potential for permanent negative impacts on landscape / seascape and / or visual amenity of low sensitivity or permanent impacts on areas with low sensitivity and / or few receptors in the development and operation of transmission infrastructure.
		-3	Significant Negative Effects	Potential for permanent negative impacts on areas of sensitive landscape / seascape and / or visual amenity, with many receptors, in the development and operation of new transmission infrastructure.

APPENDIX D

Detailed Assessment of Potential Project Effects

F1. Moyle Interconnector Capacity Increase – Project 1

Discussion of Potential Impacts
Biodiversity, Flora & Fauna There is the potential for short-term, temporary, indirect, sedimentation impacts to Larne Lough SPA, Ramsar, and ASSI, which is over 2.5 km downstream of the existing line, during the construction phase, due to the presence of a potential pathway via a river water body that transects the area (UKGBNI8NE003), as well as to East Coast Marine pSPA, North Channel pSAC, and The Maidens SAC. There is potential for short-term, temporary disturbance of the designated bird species of Larne Lough SPA during the construction stage, as the site is situated at a direct distance of *c*.450 m from the existing 275 kV line at the coast; species for which the SPA is designated are breeding Roseate Ten, Common Tern and Sandwich Tern, and wintering Light-bellied Brent Goose, while the ASSI is also designated for supporting nationally significant numbers of overwintering birds such as Goldeneye, Great Crested Grebe, Red-breasted Merganser and Shelduck. There is also the potential for short-term, temporary disturbance of the designated bird species of East Coast Marine pSPA during the construction phase. There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area following the laying of these new lines. There is slight potential for the construction works to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction works. The HRA of the TDPNI has determined that the development of this project has the potential for habitat loss impacts on Larne Lough SPA, Larne Lough Ramsar, and East Coast Marine pSPA. There is also the potential for water quality and habitat deterioration impacts on Larne Lough SPA, Larne Lough Ramsar, East Coast Marine pSPA, North Channel pSAC, and The Maidens SAC, along with disturbance and displacement impacts on Larne Lough SPA, Larne Lough Ramsar, and East Coast Marine pSPA. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.
Population & Human Health There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the study area. There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to new existing line, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works. There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of people within the study area, following the cabling construction works, from improvements to existing transmission infrastructure.
Geology, Soils & Land use There is the potential for short-term, temporary, direct impacts, such as soil compaction and loss of crops, to several types of land uses within the study area that may be crossed by the cabling works, mainly being arable land, broadleaf woodland, coastal land and urban land, during the construction works. If the new transmission line is developed within 1% of the best environmental line, there is no potential for any impacts on any ASSI site of geological heritage, or any areas of ancient and long-

established woodland or Forest Service sites. There is no potential for difficult working conditions owing to topography, i.e., no areas of upland or steep slopes, or areas of unstable ground.

There are four potentially historically contaminated sites within the study area, including a power station, a dockyard / dockland and two mineral workings sites. There is also a known abandoned mine, and one PPC site (AES Ballylumford-Ballylumford Power Station) in the area of Ferris Bay Road. If the new transmission line is developed within 1% of the best environmental line, the construction works are not likely to interact with these areas.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, following the cabling construction works.

Water

If the new transmission line is developed within 1% of the best environmental line, there is no potential for direct impacts on any water body. There is the potential for short-term, temporary, indirect impacts, including sedimentation and pollution to one section of river within the study area, which is adjacent to the Ballycronan More substation (UKGBNI8NE003). There is no potential for impacts on any drinking water rivers.

There is the potential for short term, temporary, indirect, downstream sedimentation and pollution impacts to the Larne Lough Mid coastal water body, which is currently of moderate status, during the cabling construction works. However, these risks could be avoided by maintaining good working practices during the construction works.

There is the potential for difficult working conditions during the installation of the new transmission line in the west of the study area, to the north and south of the Ballylumford Road, where there are several areas with significant 0.5% AEP pluvial flood risk in proximity to the existing 275 kV line and the Ballylumford Main substation. If the new transmission line is developed within 1% of the best environmental line, the construction works are not likely to interact with the significant area of 0.5% AEP coastal flood risk in the south-west of the study area, namely Larne Lough and the surrounding coastline.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the construction works.

Air

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the works. There are unlikely to be any further medium- or long-term impacts on local air emissions and reductions in local air quality within the study area following the cabling construction works.

Climatic Factors

If the new transmission line is developed within 1% of the best environmental line, there is unlikely to be any potential for significant loss of GHG sequestering vegetation along the cable route, as the land use is predominantly industrial or commercial units and agricultural pasture land.

There is the potential for difficult working conditions within several small areas of 0.5% AEP climate change pluvial flood risk in the west of the study area, to the north and south of Ballylumford Road. Development of the new transmission line in these parts of the study area should be avoided to minimize the risk of these impacts. If the new transmission line is developed within 1% of the best environmental line, there is unlikely to be any interaction with the area of significant 0.5% AEP climate change coastal flood risk in the south of the study area at Larne Lough and the surrounding coastline.

Material Assets & Infrastructure

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct, construction phase impacts, such as power supply disruptions and increased construction related traffic to two sections of B Road, within the study area.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct, construction phase impacts to one gas transmission line (PNG Transmission) that crosses the study area. There are two existing 275 kV transmission lines that intersect 1% of the best environmental line; development of the new line within close proximity to these existing transmission lines has the potential for short term, temporary construction constraints.

There are unlikely to be any further medium- or long-term impacts to existing infrastructure within the study area, following the construction of the new transmission line, if it is developed within 1% of the best environmental line.

If the new transmission line is developed within 1% of the best environmental line, there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as loss of crops, agricultural land (primarily improved grassland) within the study area, which could be crossed.

There is the potential for small-scale development of new electricity infrastructure within the study area, providing an increased supply of secure and reliable renewable energy, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

If the new transmission line is developed within 1% of the best environmental line, there is no potential for direct impacts on the six SMR sites, the two IHR sites, or the two listed buildings located within the wider study area. If the new transmission line is developed in proximity to any of these sites there is the potential for short-term impacts on the setting of these heritage features, however there is no potential for long-term impacts on their settings as the line will be undergrounded.

Landscape & Visual Amenity

If the new transmission line is developed within 1% of the best environmental line, there is the potential for short-term negative landscape and visual effects to the High Sensitivity to Development LCA of Island Magee. There is no potential for medium- to long-term negative effects as the line will be undergrounded.

Additional Impacts

Following the development of the new transmission line there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area. This reinforcement of electricity infrastructure will have secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on the population into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new transmission line take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new transmission line.

F2. Armagh and Drumnakelly Reinforcement – Project 2

Discussion of Potential Impacts
Biodiversity, Flora & Fauna
If the new transmission line is developed within 1% of the best environmental line, there is unlikely to be any potential for direct short- or long-term impacts on any habitat or biodiversity designations that are within the wider study area. There are no Salmonid Rivers intersected within 1% of the best environmental line; however, the Cusher River Lower, and Upper Bann reach 2, Salmonid Rivers are

situated c. 1.8 km to the east of the eastern extent of this area, within the Bann freshwater pearl mussel catchment, with potential for hydrological connectivity with the proposed area of development, while the Callan River Lower is situated c. 1.2 km to the west of the western extent of this area, with potential for hydrological connectivity. There is the potential for short-term, temporary, indirect, construction phase sedimentation impacts to these sites. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the new transmission line in proximity to any associated water bodies and, owing to the distance involved, any impacts are not expected to be significant in the medium- to long-term.

If the new substation is built within the 50% lower sensitivity area, there is no potential for direct short- or long-term impacts on any habitat or biodiversity designations that are within the wider study area. The Butter Water and Callan River Lower Salmonid Rivers are located c. 850 m to the west of the study area for the new substation; however, there are not expected to be any short-, medium-, or long-term impacts on these sites as no potential connectivity has been identified with the 50% lower sensitivity area for the new substation.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on Lough Neagh & Lough Beg SPA, and Lough Neagh & Lough Beg Ramsar Site. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to people in Armagh, Aghacommon, Derryhale and Edenveys, if the new line is built within close proximity to these main settlements.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such noise and dust, to people in several areas of lower perceived health, namely in the south Dungannon, west Fintona, Seskinore and Dromore areas, if the new line is built within proximity to these sensitive areas, which should be avoided if possible.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, indirect disturbance impacts, such as noise, to local people that are within close proximity to the new line in a relatively low population density region. There are unlikely to be any further medium- or long-term negative impacts to people within the study area, following the construction of the new transmission line, if it is developed within 1% of the best environmental line.

If the new substation is built within the 50% lower sensitivity area, there is the potential for short-term, temporary, direct disturbance impacts, such as noise and dust, along with negative health impacts, including to people in the southern periphery of Armagh settlement area, during the construction phase of the new substation. This is unlikely to impact on a significant population owing to the low-density population of the 50% lower sensitivity area.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of a significant volume of secure and reliable electricity, to meet future needs of the population, following the construction of the new transmission line, from the provision of new transmission infrastructure.

Geology, Soils & Land use

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct, construction phase impacts, such as soil compaction or destabilisation, current land use disruption and loss of crops, to several types of land uses which may be crossed by the new line, mainly being agricultural areas (primarily improved grassland, with

some semi-natural grassland and arable land), with an area of suburban land at the southern end of the 1% best environmental line, and small areas of broadleaf woodland.

There are 17 potentially historically contaminated sites in the area that is within 1% of the best environmental line (including the Richhill Waste Disposal Limited Site, sewage works and sewage farms, former railway land, ceramics, cement and asphalt manufacturing works, textile works, and dye works). Works crossing these sites in the short-term could lead to temporary or permanent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area; therefore, this should be avoided if possible.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, following the construction of the new transmission line, if it is developed within 1% of the best environmental line.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising agricultural land (improved grassland and some semi-natural grassland), but also including an area of suburban land use associated with the southern extent of Armagh in the north of the lower sensitivity area.

Drumarg ASSI, comprising a disused quarry and lands, is situated c. 450 m to the north-west of the study area for the new substation, and is designated for earth science features; however, there are not expected to be any short-, medium-, or long-term impacts on this site as no potential connectivity has been identified with the 50% lower sensitivity area for the new substation.

There are two historical land use sites intersecting the 50% lower sensitivity area for the new substation that have the potential to be contaminated, both of which are mineral working sites. These sites should be avoided to prevent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area.

Water

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks to 56 sections of river that intersect this area, and the potential for short-term, temporary, direct or indirect, construction phase sedimentation and pollution impact to six WFD river water bodies that intersect the area: Annagh River, Ballybay River, Callan River (Derryscollop), Killeen Water, Kilmore Tributary, Tall River (Richhill), all of which are of less than Good WFD status. However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new transmission line and these sections of river, where possible, and by maintaining good working practices in the construction of the new transmission line in proximity to water bodies.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, indirect, construction phase sedimentation and pollution impact to two WFD Rivers, Callan River (Derryscollop), and Killeen Water, both of which are of less than Good WFD status. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, through the centre of the area and in both the north-east and south-west, where there are significant areas of 1% AEP fluvial flood risk associated with rivers. There are numerous areas with significant 0.5% AEP pluvial flood risk that are intersected by the area comprising 1% of the best environmental line, and areas of significant 0.5% AEP pluvial flood risk in the north-west and running from north-east to south-east of the 50% lower sensitivity area for the new substation. These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line and substation. Development of the new infrastructure in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

Air

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary increases in local air emissions and reductions in local air quality, within a sensitive area (the Armagh City, Banbridge and Craigavon Borough Council AQMA, which

covers the entire borough) that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

If the new substation is developed within the 50% lower sensitivity area of the study area there is the potential for short term, temporary increases in local air emissions and reductions in local air quality, within a sensitive area (the Armagh City, Banbridge and Craigavon Borough Council AQMA, which covers the entire borough) that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There are several small, scattered areas of GHG sequestering natural cover (broadleaf woodland) within 1% of the best environmental line in the study area, including in the north-east extent of the area, intersecting the south-western part of Craigavon. There is also a small area of GHG sequestering natural cover (broadleaf woodland) within the study area for the new substation, although this is primarily avoided within the 50% lower sensitivity area. To minimise the potential for short-, medium- or long-term loss of GHG sequestering natural cover during and following the construction of the new line and substation, development over these areas should be avoided.

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, through the centre of the area and in both the north-east and south-west, where there are significant areas of 1% AEP climate change fluvial flood risk associated with rivers. There are numerous areas with significant 0.5% AEP climate change pluvial flood risk that are intersected by the area comprising 1% of the best environmental line, and areas of significant 0.5% AEP pluvial flood risk in the north-west and running from north-east to south-east of the 50% lower sensitivity area for the new substation. These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line and substation. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts. However, climate change flood risk within the study area is not significantly different from the current day scenario risk, which is already scored under the Water section. Furthermore, ensuring that the sections of transmission lines in these flood risk areas are resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

If the new line is developed within 1% of the best environmental line there is the potential for short term, temporary, construction phase increases in local GHG emissions, in areas which are crossed the new line, from the use of construction equipment. If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium or long term increases in local GHG emissions within the study area following the construction of the new line and substation.

Material Assets & Infrastructure

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to seven section of A roads, six sections of B roads, nine sections of minor roads, and 34 sections of <4 m tarred roads within the study area.

The Gas to the West and SN spur pipelines cross through the area that is within 1% if the best environmental line. The presence of this existing infrastructure has the potential for short-term, temporary planning constraints relating to the development of the new line. There are five existing 110 kV overhead transmission lines, and two existing 275 kV overhead transmission lines within 1% of the best environmental line. Development of the new transmission line within close proximity to these existing infrastructures has the potential for short-term, temporary construction constraints, and should be avoided.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct disturbance impacts, such as loss of crops, to several types

of agricultural land (primarily improved grassland, with some areas of semi-natural grassland and arable land) within the study area which are crossed by the 1% corridor.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short -term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to two sections of A road and one section of B road within the study area.

There are 11 existing 110 kV OHLs, and six existing 275 kV OHLs within the 50% lower sensitivity area; development of the new substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (predominantly improved grassland).

There are unlikely to be any further medium- or long-term impacts to existing infrastructure within the study area, following the construction of the new line and new substation, if they are developed within 1% of the best environmental line and the 50% lower sensitivity areas, respectively.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within 1% of the best environmental line there are a number of designated heritage features comprising: one listed Park and Gardens of The Palace (Armagh), 19 Industrial Heritage features, six listed buildings, three scheduled zones (a heniform enclosure and two raths), and 20 SMR sites. If the new transmission line is developed within close proximity to these sites there is the potential for direct impacts and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new substation, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new substation.

Within the 50% lower sensitivity area of the study area there are a number of designated heritage features including: one Scheduled Zone (a heniform enclosure in the north-east of the area), three SMR sites (comprising a standing stone in the centre of the area, and a heniform enclosure and the south meridian marker for the Armagh Observatory in the south-east of the area), one Listed Building (the south meridian marker), and one listed Park and Gardens of The Palace (Armagh). If the new substation is developed within close proximity to these sites there is the potential for direct impacts and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new substation, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new substation.

Landscape & Visual Amenity

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to two LCAs that are within the study area, both of which are of Medium / High sensitivity to development: Armagh Drumlins LCA and Loughgall Orchard Belt LCA).

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to two LCAs that are within the study area, the Upper Bann Floodplain LCA and the Loughgall Orchard Belt LCA; these areas are of High and Medium / High sensitivity to development, respectively.

Additional Impacts

Following the development of the new transmission line there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area. This reinforcement of electricity infrastructure will have secondary, positive impacts on other assets, which in turn has the

potential to have positive impacts on the population into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new transmission line take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new transmission line.

F3. East Tyrone Reinforcement – Project 3

Discussion of Potential Impacts
Biodiversity, Flora & Fauna There are no habitat or biodiversity designations that intersect the 50% least cost area, and no sites that are hydrologically linked to this area. There is no potential for impacts on International, National or locally designated sites and species in the construction and operation of this substation extension. There is the potential for short-term temporary, or permanent, direct negative impacts on non-designated, semi-natural habitats within the study area in the construction and operation of this substation extension. Construction and operation of the substation extension is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction. The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.
Population & Human Health There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area. There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works. There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the substation redevelopment.
Geology, Soils & Land use If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising improved grassland and semi-natural grassland, but also including a small area of broadleaf woodland to the south-west of the existing substation in the lower sensitivity area. There is the potential for short-term, temporary, construction phase, interactions with one potentially hazardous soils and activities within the study area during the construction phase, which is an abandoned mine situated to the west of the existing substation.

Water

If the extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to two river WFD water bodies, the Tamnamore Stream and the Torrent River, which are of Moderate WFD status and Moderate Ecological Potential WFD status, respectively. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the extended substation.

There is the potential for difficult working conditions and / or flooding of the extended substation associated with small areas with 0.5% AEP pluvial flood risk in the north of the 50% lower sensitivity area. Development of the extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the extended substation.

Air

If the extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the extended substation associated with small areas with 0.5% AEP pluvial flood risk in the north, south-west, and associated with the existing substation within the 50% lower sensitivity area. Development of the extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the extended substation is developed within the 50% lower sensitivity area within the study area, there is the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the small area of broadleaf woodland to the south-west of the existing substation in the lower sensitivity area. To minimise the potential of these impacts, development of the extended substation within this area should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Material Assets & Infrastructure

If the extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to a section of minor road that intersects the south-west part of the lower sensitivity area.

There are ten existing 110 kV OHLs that intersect the 50% lower sensitivity area; development of the extended substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints.

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (improved grassland and semi-natural grassland).

If the new / extended substation is developed within the 50% lower sensitivity area there are unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There are unlikely to be any significant short-, medium- or long-term impacts on any known heritage features, or their settings, within the study area, in the development and operation of the new / extended substation, as there are no known heritage features in close proximity to the existing substation.

Landscape & Visual Amenity

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to one Landscape Character Area, Dungannon and Drumlin Hills LCA, which is of Medium / High sensitivity to development.

Additional Impacts

Following the development of the new / extended substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.

F4. Newry Reinforcement – Project 4

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

If the new substation is built within the 50% lower sensitivity area, there is no potential for direct short- or long-term impacts on any habitat or biodiversity designations that are within the wider study area. The Carlingford Shore SAC, designated for coastal habitats, is situated over 7 km downstream of the 50% lower sensitivity area; there is slight potential for short-term, downstream sedimentation and pollution impacts to this site during the construction phase of the new substation. If the new substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short-, medium- and long-term, permanent loss of non-designated, semi-natural habitats. Construction and operation of the substation is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

There is potential for short-term, temporary, direct disturbance and / or indirect sedimentation impacts on one SLNCI that intersects the existing Newry – Tandragee OHL, and for short-term, temporary, indirect, impacts to Goraghwood Quarry, which is in close proximity to the existing OHL, during the restring. There is the potential for short-term, temporary, direct disturbance and indirect sedimentation impacts to four Salmonid Rivers during the construction phase of the restring, as the existing line crosses these rivers, namely the Clanrye River Lower, Cusher River Lower, Jerretspass

River and Newry River Upper. There is the potential for short-term, temporary, indirect downstream sedimentation and pollution impacts to Carlingford Shore ASSI, over 4 km downstream. There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the 110 kV circuits restring. There is the potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the existing OHL. Construction of this 110 kV circuit restring has the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

Option B: Construction of a new substation near Newtownhamilton.

There is potential for temporary, indirect, sedimentation and pollution impacts to the Creggan River Upper Salmonid River, which is c. 1 km downstream of the 50% lower sensitivity area, during the construction works, due to the presence of a potential pathway via a river water body that transects the area (UKGBNI0612827). If the new substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short-, medium- and long-term, permanent loss of non-designated, semi-natural habitats. Construction and operation of the substation is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

If the new transmission line is developed within 1% of the best environmental line, there is the potential for short-term, temporary, direct disturbance and indirect sedimentation or pollution impacts to seven Salmonid Rivers during the construction phase, the Clanrye River Lower, Cusher River Lower Middle, Cusher River Upper Middle, Jerrettspass River, Mowhan R (Clady Water), Newry River Upper and Whitecross Stream. There are no other habitat or biodiversity designations that intersect, or are downstream of, this lower cost area. There is unlikely to be any other potential for impacts on International, National or locally designated sites and species in the construction and operation of this new OHL.

There is the potential for short-term temporary, or permanent, direct negative impacts on non-designated, semi-natural habitats within the study area in the construction and operation of this new OHL.

Construction and operation of the new OHL is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of the Newry Reinforcement project has the potential for water quality and habitat deterioration impacts on Carlingford shore SAC, Carlingford Lough SPA (NI/ROI), Carlingford Lough Ramsar, Carlingford Marine pSPA, Derryleckagh SAC, Carlingford Shore SAC, Carlingford Lough Ramsar, and Rostrevor Wood SAC. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the population that are within close proximity to the new substation, during the construction phase, including within the high population density settlement of Newry and within socially sensitive areas (areas of lower perceived health) in Newry, and medium to long-term effects from the presence of new infrastructure in these high population density and socially sensitive areas (-2).

There is the potential for short term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the populations that are within close proximity to the existing Newry – Tandragee OHL, to the high-density population areas within the settlements of Newry and Tandragee that are intersected by, or in close proximity to the existing OHL, and within socially sensitive areas (areas of lower perceived health) within Newry and towards Tandragee, during the restring. There are unlikely to be any further medium or long-term negative impacts to local populations following the development of the 110 kV restring.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of people within the study area, following the construction works, from improvements to existing transmission infrastructure.

Option B: Construction of a new substation near Newtownhamilton.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the population that are within close proximity to the new substation, during the construction phase in a generally low population density area, including within the settlement of Newtownhamilton. There are not socially sensitive population areas within the area that have potential to be impacted. There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of a significant volume of secure and reliable electricity, to meet future needs of the population, following the construction of the new transmission line, from the provision of new transmission infrastructure.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to people in high density population areas of Armagh, Aghacommon, Edenaveys and Newry, if the new line is built within close proximity to these main settlements. There is the potential for short-term, temporary, indirect, construction phase disturbance impacts to the population of socially sensitive areas, including one Neighbourhood Renewal Area in Newry, and areas of lower perceived health near Newry and the wider Markethill area.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of a significant volume of secure and reliable electricity, to meet future needs of the population, following the construction of the new transmission line, from the provision of new transmission infrastructure.

Geology, Soils & Land use

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short, medium and long term, permanent, direct loss of several types of land use, including suburban / urban land, agricultural land (improved grassland and semi-natural grassland), and broadleaf woodland (although this is primarily avoided within the 50% lower sensitivity area).

There is the potential for short-term, temporary, direct, construction phase impacts to one long-established ancient woodland (Armagh), which is crossed by the existing Newry – Tandragee OHL, and for short-term, temporary, indirect, construction phase impacts to 25 additional areas of ancient woodland (Newry and Mourne, Armagh), and one area of Forest Service land (Drumbanagher) that are in proximity to the existing line.

There is the potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities that have the potential of being contaminated within the study area during the restring, being direct interaction with five historic land use sites (military installations, mineral workings, railway land, engineering works, and timber products manufacturing) that are crossed by the existing line, and indirect interactions with 30 additional historic land use sites, which are all in proximity (within 500 m) of the existing line. There is the potential for short-term, temporary, direct interactions with two areas of upland topography, as the existing line crosses these areas, as well as one abandoned mine that is in close proximity to the existing line; these areas may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this substation and OHL uprate.

Option B: Construction of a new substation near Newtownhamilton.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising agricultural land (improved grassland), with small strips of broadleaf woodland. There is one historical land use area (waste recycling, treatment and disposal site for metal recycling), located in the south-west of the 50% lower sensitivity area, that has the potential to be contaminated; this site should be avoided to prevent impacts on nearby soils and land use, as works crossing this site has the potential to track contaminated materials further though the study area. There is the potential for difficulties during construction and maintenance works in the upland area that intersects the entirety of the 50% lower sensitivity area.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct, construction phase impacts, such as soil compaction or destabilisation, current land use disruption and loss of crops, to several types of land uses which may be crossed by the new line, predominantly being agricultural areas (primarily improved grassland, with some semi-natural grassland and arable land), with areas of suburban / urban land around Armagh and Newry, and small areas of broadleaf woodland.

If the new transmission line is developed within 1% of the best environmental line, there is potential for short-term direct disturbance, to permanent loss of 17 areas of ancient and long-established woodland (seven of which are recorded as lost). There is potential for short-term, temporary, difficult working conditions owing to topography within eight areas of steep uplands, one area of unstable ground comprising peat (near Armagh), and in the vicinity of one known abandoned mine that are within 1% of the best environmental line.

There are 40 potentially historically contaminated sites in the area that is within 1% of the best environmental line (including mineral workings, military installations, textile works and dye works, former railway lands, ceramics, cement and asphalt manufacturing works), and one PPC site (Ballindarragh Poultry Farm). Works crossing these sites in the short-term could lead to temporary or permanent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area; therefore, this should be avoided if possible.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, following the construction of the new transmission line, if it is developed within 1% of the best environmental line.

Water

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to one WFD river water body, the Newry River, which is of Moderate WFD status, and for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks to two sections of river that intersect this area (UKGBNI0612888 and GBNI0600314). However, the risk of these impacts can be minimised if there is a sufficient buffer zone between the new substation and these sections of river, and by maintaining good working practices in the construction of the new substation. There is the potential for difficult working conditions and / or flooding of the new substation associated with several areas with 0.5% AEP pluvial flood risk. Development of the new substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts. There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new substation.

There is the potential for short-term, temporary, direct or indirect impacts, including sedimentation, pollution and damage to river banks, to 47 sections of river within the study area, which are crossed by or in close proximity to the existing line, during the construction phase of the Newry – Tandragee OHL restring. Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to seven WFD river water bodies within the study area, Annagh River, Bessbrook (Newry) River, Cusher River (Tandragee), Jerretspass River, Loughgilly River, Newry Canal and Newry River, all of which are of less than Good WFD status. However, these risks could be avoided by maintaining good working practices during the restring. There is the potential for difficult working conditions during the construction of the restring where there are several areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line, and where there are scattered areas of significant 0.5% AEP pluvial flood risk that are crossed by, or in proximity to, the existing line. There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the OHL.

Option B: Construction of a new substation near Newtownhamilton.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to one WFD river water body, the Creggan River, which is of Moderate WFD status, and for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks to two sections of river that intersect this area (UKGBNI0612827 and GBNI0600200). However, the risk of these impacts can be minimised if there is a sufficient buffer zone between the new substation and these sections of river, and by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions and / or flooding of the new substation associated with an area of 1% AEP fluvial flood risk along the river the intersects the 50% lower sensitivity area for the substation, and with several areas with 0.5% AEP pluvial flood risk. Development of the new substation in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts. There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new substation.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks to 84 sections of river that intersect this area, and the potential for short-term,

temporary, direct or indirect, construction phase sedimentation and pollution impact to 12 WFD river water bodies that intersect the area: Ballybay River, Bessbrook (Newry) River, Callan River (Derryscollop), Cusher River (Mount Norris), Cusher River (Tandragee), Cusher River (Windy Gap), Jerretspass River, Killeen Water, Markethill River, Mowhan River, Newry Canal, Newry River, Tall River (Richhill), Whitecross River), all of which are of less than Good WFD status. However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new transmission line and these sections of river, where possible, and by maintaining good working practices in the construction of the new transmission line in proximity to water bodies

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, particularly through the centre of the area where there are significant areas of 1% AEP fluvial flood risk associated with rivers (and including the Newry, Richill, Tandragee, Gilford, Laurelvale, Scarva, Pontyz Pass, Newtownhamilton, Hamiltonsbawn, Markethill and Mountnorris areas). There are also numerous areas with significant 0.5% AEP pluvial flood risk that are intersected by the area comprising 1% of the best environmental line (including in the Newry, Mountnorris, Hamiltonsbawn, Pontyz Pass and Richill areas). These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line. Development of the new infrastructure in these areas should be avoided to minimize the risk of these impacts.

Air

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, including within a sensitive area (the Newry (Urban Centre) AQMA) that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, including within two sensitive areas (the Armagh City, Banbridge and Craigavon Borough Council AQMA, and the Newry (Urban Centre) AQMA) that will be in close proximity to the construction works, from the use of construction equipment during the restring of the Newry – Tandragee OHL.

There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Option B: Construction of a new substation near Newtownhamilton.

If the new substation is developed within the 50% lower sensitivity area of the study area there is the potential for short term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium or long term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary increases in local air emissions and reductions in local air quality, including within two sensitive areas (Armagh City, Banbridge and Craigavon Borough Council AQMA and the Newry (Urban Centre) AQMA) that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

There is the potential for difficult working conditions and / or flooding of the new substation associated with several areas with 0.5% AEP climate change pluvial flood risk. Development of the new substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts. There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new substation. If the new substation is developed within the 50% lower sensitivity area within the study area has the potential for short, medium and long term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the area of broadleaf woodland (although this is primarily avoided within the 50% lower sensitivity area). To minimise the potential of these impacts, development of the new substation within this area should be avoided.

There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from the uprating of the Newry – Tandragee OHL, as uprates are unintrusive and generally only involve agricultural type equipment moving across land. There is the potential for difficult working conditions during the construction of the restring where there are several areas of significant 1% AEP climate change fluvial flood risk associated with rivers that cross the existing line, and where there are scattered areas of significant 0.5% AEP climate change pluvial flood risk that are crossed by, or in proximity to, the existing line. However, climate change fluvial and pluvial flood risk within this area is not significantly different from the current day scenario risk which is already scored under the Water section. Furthermore, ensuring that the OHL infrastructure in these flood risk areas are resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

There is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation and uprating of OHL cables.

Option B: Construction of a new substation near Newtownhamilton.

There is the potential for difficult working conditions and / or flooding of the new substation associated with an area of 1% AEP climate change fluvial flood risk along the river the intersects the 50% lower sensitivity area for the substation, and with several areas with 0.5% AEP climate change pluvial flood risk. Development of the new substation in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts. There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new substation. If the new substation is developed within the 50% lower sensitivity area within the study area has the potential for short, medium and long term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the area of broadleaf woodland (although this is primarily avoided within the 50% lower sensitivity area). To minimise the potential of these impacts, development of the new substation within this area should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area, there is not expected to be any significant loss of GHG sequestering vegetation. There is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

There are several small, scattered areas of GHG sequestering natural cover (broadleaf woodland) within 1% of the best environmental line in the study area. To minimise the potential for short-, medium- or long-term loss of GHG sequestering natural cover during and following the construction of the new line, development over these areas should be avoided.

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, particularly through the centre of the area where

there are significant areas of 1% AEP climate change fluvial flood risk associated with rivers (and including the Newry, Richill, Tandragee, Gilford, Laurelvale, Scarva, Pontyz Pass, Newtownhamilton, Hamiltonsbawn, Markethill and Mountnorris areas). There are also numerous areas with significant 0.5% AEP climate change pluvial flood risk that are intersected by the area comprising 1% of the best environmental line (including in the Newry, Mountnorris, Hamiltonsbawn, Pontyz Pass and Richill areas). These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line. Development of the new infrastructure in these areas should be avoided to minimize the risk of these impacts.

If the new line is developed within 1% of the best environmental line there is the potential for short-term, temporary, construction phase increases in local GHG emissions, in areas which are crossed the new line, from the use of construction equipment. There are unlikely to be any further medium- or long-term increases in local GHG emissions within the study area following the construction of the new line.

Material Assets & Infrastructure

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to one section of A road, two sections of minor road, and one section of < 4 m tarred road. There are two existing 110 kV overhead transmission lines that intersect the 50% lower sensitivity area; development of the new substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints. If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (improved grassland and semi-natural grassland).

There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to 27 sections of A road, 13 sections of B road, 56 sections of minor road, 41 sections of <4 m tarred roads, and two sections of railway line, that intersect the existing Newry – Tandragee OHL or are in close proximity, during the restring. The gas transmission line of the S-N pipeline intersects the existing line north of Newry. There are 11 existing 110 kV OHLs, and six existing 275 kV OHLs that intersect or are in proximity to the existing line. There is the potential for short-term, temporary, difficulties during construction in the areas in which this infrastructure is crossed by the Newry – Tandragee OHL that is to be uprated. There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land (improved grassland and semi-natural grassland) that are crossed by the existing Newry – Tandragee OHL, during the restring.

There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring and construction of the new substation.

There is the potential for moderate scale local development of new electricity grid infrastructure, and development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit and construction of a new substation, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Option B: Construction of a new substation near Newtownhamilton.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to three sections of A road, two sections of B road, three sections of minor road, and three sections of < 4 m tarred road. There are two existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints. If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (improved grassland).

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to 21 sections of A roads, 16 sections of B roads, 28 sections of minor roads, and 82 sections of <4 m tarred roads. A railway line and the S-N gas pipeline cross through the area that is within 1% if the best environmental line. The presence of this existing infrastructure has the potential for short term, temporary planning constraints relating to the development of the new line. There are two existing 110 kV OHLs, and two existing 275 kV OHLs within 1% of the best environmental line. Development of the new transmission line within close proximity to these existing infrastructures has the potential for short term, temporary construction constraints, and should be avoided.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct disturbance impacts, such as loss of crops, to agricultural land (predominantly improved grassland, with very minor areas of semi-natural grassland and arable land) within the study area which are crossed by the 1% corridor.

There are unlikely to be any further medium- or long-term impacts to existing infrastructure within the study area, following the construction of the new line, if it is developed within 1% of the best environmental line. There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

Within the 50% lower sensitivity area for the new substation there is one SMR site (prehistoric occupation site) and one Listed Building (Crieve House). If the new substation is developed within close proximity to these sites there is the potential for direct impacts on these sites and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new substation, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new substation.

There is the potential for short-term, temporary, indirect, construction phase disturbance to 66 SMR sites (e.g., raths, enclosures, standing stones), nine Scheduled Zones (e.g., Newry Canal, Standing Stones, Raths), 52 Industrial Heritage record sites, one Defence Heritage site, and 24 listed buildings, which are all crossed by or in close proximity to the existing Newry – Tandragee line. There is potential for short-term, temporary, direct or indirect disturbance to two listed Parks and Gardens (Drumbanagher and Tandragee Castle), and one Area of Archaeological Potential (Newry) during the restring, which are crossed by the existing line. There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring.

Option B: Construction of a new substation near Newtownhamilton.

Within the 50% lower sensitivity area for the new substation there is one SMR site (Findspot of Wooden Posts); if the new substation is developed within close proximity to this site there is the potential for direct impacts and / or indirect impacts on the setting of, this heritage feature, and therefore this should be avoided. If there is a sufficient buffer between this site and the new substation, there are unlikely to be any significant short-, medium- or long-term impacts on, this feature or its setting within the study area, in the development and operation of the new substation. If the new substation construction is undertaken within the Area of Archaeological Potential (Newtownhamilton) that intersects the western extent of the 50% lower sensitivity area, there is the potential for direct, temporary to permanent, impacts on this site, and therefore this should be avoided.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

Within 1% of the best environmental line there are a number of designated heritage features comprising: one listed Park and Gardens of The Palace (Armagh), 71 Industrial Heritage features, 70 Listed Buildings (e.g., Ardmore Hotel, Ash Grove Lodge), 11 Scheduled Zones (e.g., raths, Newry Canal and standing stones), 60 SMR sites, and one Area of Archaeological Potential (Newry). If the new transmission line is developed within close proximity to these sites there is the potential for direct impacts and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new OHL, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new OHL.

Landscape & Visual Amenity

Option A: Construction of a new substation adjacent to Newry Main. Uprating of the OHL to Tandragee.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to one Landscape Character Area, Newry Basin LCA, which is of High / Medium sensitivity to development.

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within six LCAs that are intersected by the existing Newry – Tandragee OHL; of these, one is of High sensitivity (Upper Bann Floodplains LCA), three are of Medium / High sensitivity (Loughgall Orchard Belt LCA, Armagh Drumlins LCA and Newry Basin LCA) and two are of Medium sensitivity (Armagh / Banbridge Hills LCA and Carrigatuke Hills LCA) to development.

There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting.

Option B: Construction of a new substation near Newtownhamilton.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to one Landscape Character Area, Carrigatuke Hills LCA, which is of Low / Medium sensitivity to development.

Option C: Construction of a new 33 kV distribution circuit from Newry to Armagh.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects within three Landscape Character Areas that are within the study area; of these, Carrigatuke Hills LCAs is of Medium sensitivity, whereas Armagh Drumlins LCA and Newry Basin LCA are of Medium - High sensitivity to development.

Additional Impacts

Option A

Following the restring and new substation development, there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring and substation development take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

Option B

Following the new substation development, there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the substation development take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

Option C

Following the development of the new transmission line there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area. This reinforcement of electricity infrastructure will have secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on the population into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new transmission line take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new transmission line.

F5. Coolkeeragh – Limavady – Coleraine 110 kV Uprating – Project 5

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is the potential for short-term, temporary, direct disturbance and indirect sedimentation impacts on the River Faughan and Tributaries SAC and ASSI, and the River Roe and Tributaries SAC and ASSI, and associated species, in particular Atlantic Salmon *Salmo salar* and Otters *Lutra lutra* within both sites, during the construction phase of the restring, as the existing line crosses these rivers.

There is the potential for short-term, temporary, direct disturbance and / or indirect sedimentation impacts on four SLNCIs that intersect the existing line (Ballykelly Glen, Ballykelly Moraine, Lower Kiltinny, and River Roe), and for indirect disturbance and / or sedimentation impacts on four other SLNCIs that are in proximity to the existing line (Castle River Woodland, Deer Park Wood, Dogleap, Faughanvale).

There is the potential for short-term, temporary, direct disturbance and indirect sedimentation impacts to 14 Salmonid Rivers during the construction phase of the restring, as the existing line crosses these rivers, namely the Burnfoot River Tributary, Ballykelly River, Burn Dennet Lower, Burnfoot River, Cam Burn, Castle River Tributary, Castle River, Glenmornan River, Macosquin River, Muff River, River Faughan Lower, River Faughan Lower Middle, River Roe Middle, and Burngibbagh; and for short-term, temporary, indirect, downstream sedimentation impacts to River Roe Lower Middle, River Roe Lower, and Curley River Lower during the restring works.

There is the potential for short-term, temporary, indirect sedimentation impacts on Lough Foyle SPA, Ramsar site, ASSI and RSPB Reserve owing to potential hydrological connectivity with rivers that cross the existing line, and for short-term, temporary direct disturbance of designated bird species during the construction phase of the restring.

There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the 110 kV circuits restring.

Construction of this 110 kV circuit restring has the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on River Finn SAC, Lough Foyle SPA, Lough Foyle Ramsar, and River Roe and Tributaries SAC, along with disturbance and displacement impacts on Lough Foyle SPA and Lough Foyle Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is the potential for short-term, temporary, indirect, construction phase, disturbance impacts, such as noise and dust, to the population in Ardgarvin and in the eastern periphery of Strathfoyle, as both of these areas are crossed by the 110 kV existing circuit. There is also the potential for short-term, temporary, indirect, construction phase, disturbance impacts, such as noise and dust, to the population in the eastern extent of Derry / Londonderry City, south-western extent of Coleraine, and the villages of Maydown, Lettershendoney, Glack, and Macosquin, each of which are within 500 m of the existing transmission line.

There is the potential for short-term, temporary, indirect, construction phase, disturbance impacts, such as noise and dust, to the populations of two areas of lower perceived health, near Strathfoyle, and south of Killywool, as the existing line is in close proximity to these areas.

There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the local population that are within close proximity to the existing line, during the restring. There are unlikely to be any further medium or long-term negative impacts to local populations following the development of the 110 kV restring.

There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the restring, from improvements to existing transmission infrastructure.

Geology, Soils & Land use

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the existing line during the restring works, mainly being agricultural land (predominantly improved grassland with some semi-natural and natural grassland and areas of arable land), with some areas of broadleaf and coniferous woodland, and two areas of sensitive peatland that intersect the existing line.

There is not expected to be any potential for impacts to any ASSI site of geological heritage during the restring works, as the two sites within the wider study area, Bovevagh and Loughermore Mountain, are situated at a distance of c. 5.5 km and c. 4.5 km from the existing line, with no potential connectivity.

There is the potential for short-term, temporary, direct, construction phase impacts to two long-established woodlands in Londonderry / Derry, which are crossed by the existing line, and for short-term, temporary, indirect, construction phase impacts to 14 areas of ancient woodland that are in proximity to the existing line (Coleraine, Derry and Limavady). There is the potential for short-term, temporary, direct, construction phase impacts to three (Cam), and for short-term, temporary, indirect, construction phase impacts to six additional (Cam, Muff Glen, Somerset and Springwell), areas of Forest service land that intersect or are in proximity to the existing line, respectively.

There is the potential for short term, temporary, interactions with areas of potentially hazardous soils and activities within the study area during the restring, being direct interaction with 16 historic land use sites (e.g., military installations, mineral workings, railway land, textile works and dye works) that are crossed by the existing line, and indirect interactions with 95 additional historic land use sites (e.g., chemical works, textile works and dye works, mineral workings, road vehicle fuelling), one quarry and seven PPC sites, which are all in proximity (within 500 m) of the existing line.

There is the potential for short-term, temporary, direct interactions with three areas of upland topography, and six areas of unstable ground comprised of peat, during the uprate, as the existing line crosses these areas, as well as one identified landslide area in close proximity to the existing line; this may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate.

Water

There is the potential for short-term, temporary, direct impacts, including sedimentation, pollution and damage to river banks, to 157 sections of river within the study area, which are crossed by the existing line, during the construction phase of the restring.

Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to one transitional WFD water body (Lough Foyle; of Good WFD status) 15 WFD river water bodies (Macosquin River, Shinney Water, Aghadowey River, Castle River, River Roe (Ballycarton), River Roe (Limavady) Burngibbagh, Bessbrook (Foyle) River, Ballykelly River, Faughanvale River, Muff River Sandville Burn Burn Dennet River (Milltown), Glenmornan River, and Faughan River (Carnmoney); of which eight are of Good status and seven are of Moderate status), and two drinking water rivers (the Macosquin River and the River Faughan) within the study area. However, these risks could be avoided by maintaining good working practices during the restring.

There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line. There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 0.5% AEP pluvial flood risk, primarily associated with rivers, that are crossed by the existing line.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the 110 kV line.

Air

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, in non-sensitive areas that are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring. There are unlikely to be any further medium- or long-term negative impacts on local air emissions and reductions in local air quality within the study area following the restring.

Climatic Factors

There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development as uprates are unintrusive and generally only involve agricultural type equipment moving across land.

There is the potential for short-term, temporary increases in local GHG emissions, in areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring. There is unlikely to be any further medium- or long-term increases in local GHG emissions within the study area following the restring.

There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP climate change fluvial flood risk associated with rivers that cross the existing line. There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 0.5% AEP climate change pluvial flood risk, primarily associated with rivers, that are crossed by the existing line. However, climate change fluvial and

pluvial flood risk within this area is not significantly different from the current day scenario risk which is already scored under the Water section. Furthermore, ensuring that the 110 kV line infrastructure in these flood risk areas are resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

Material Assets & Infrastructure

There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to four sections of dual carriageway, ten sections of A roads, 19 sections of B road, 129 sections of minor road and 19 sections of <4 m tarred roads, within the study area during the restring. There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to one section of railway that intersects the western periphery of the uprate area.

The North-West gas pipeline intersects the existing line at several locations. There are 27 existing 110 kV OHLs, and six existing 275 kV OHLs that intersect or are in proximity to the existing line. There is the potential for short-term, temporary, difficulties during construction in the areas in which this infrastructure is crossed by the 110 kV line that is to be uprated.

There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land that are crossed by the existing 110 kV line, during the restring.

There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

There is the potential for the development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There is the potential for short-term, temporary, indirect, construction phase disturbance to 82 SMR sites, 107 Industrial Heritage sites, 40 Defence Heritage sites, and 65 listed buildings, which are all crossed by or in close proximity to the existing line. There is potential for short-term, temporary, direct or indirect disturbance to 10 Scheduled Zones, four listed Parks and Gardens, and one Area of Archaeological Potential during the restring, which are all crossed by or in close proximity to the existing line.

There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring.

Landscape & Visual Amenity

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects to the Binevenagh AONB during the development of the 110 kV restring, as the eastern section of the existing line crosses this site.

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects to the Roe Valley Country Park, during the development of the 110 kV restring, as the central section of the existing line crosses this site.

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within 8 LCAs: Binevenagh, Burnigibbagh and Drumahoe, Coleraine Farmland, Eastern Binevenagh Slopes, Garvagh Farmland, Lough Foyle Alluvial Plain, Loughermore Hills, and Roe Basin. Coleraine Farmland LCA is particularly at risk for impacts during the development of the 110 kV restring, as the eastern extent of the existing line crosses this Highly Sensitive to Development LCA.

There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting.

Additional Impacts

Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F6. Drumnakelly – Tamnamore 110 kV Uprating – Project 6

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the least cost line for the undergrounding of cable through Killyman village. There is slight potential for the construction works to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction works.

There is the potential for short-term, temporary, direct disturbance and / or indirect sedimentation impacts on one SLNCI, Argory Mosses, that intersects the existing line Drumnakelly – Tamnamore 110 kV OHL during the restring, and for short-term, temporary, indirect, downstream sedimentation impacts to Lough Neagh and Lough Beg SPA and Ramsar sites, Lough Neagh ASSI and to one SLNCI, Derryore. There is the potential for short-term, temporary, direct disturbance and indirect sedimentation impacts to one Salmonid River, the River Blackwater Lower, during the construction phase of the restring, as the existing line crosses this river, and short-term, temporary, indirect, downstream sedimentation impacts to one Salmonid Lake, Neagh Lough. There is also the potential for short-term, temporary, indirect, downstream sedimentation impacts to the Bann Freshwater Pearl Mussel Catchment. There is the potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the existing OHL. There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the 110 kV circuits restring. Construction of this 110 kV circuit restring has the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts, along with disturbance and displacement impacts, on Lough Neagh and Lough Beg SPA, and Lough Neagh and Lough Beg Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is the potential for short-term, temporary, indirect, construction phase, disturbance impacts, such as noise and dust, to the population in Killyman village during the undergrounding of cables.

There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the population within the south-western extent of Craigavon urban area, which is intersected by the existing Drumnakelly – Tamnamore 110 kV OHL, to the population within Ardress village, which is adjacent to this OHL, and to the local population that are within close

proximity to the existing line in a low population density area, during the restring. There are unlikely to be any further medium or long-term negative impacts to local populations following the development of the 110 kV restring.

Geology, Soils & Land use

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the least cost line for the undergrounding of cables through Killyman village, mainly being agricultural land (predominantly improved grassland with some semi-natural grassland), and built-up areas, with small areas of broadleaf woodland. There is no potential for interaction with any known geological features of interest, potentially hazardous sites or difficult working conditions owing to the topography in the vicinity of this area.

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the existing line during the restring works, mainly being agricultural land (predominantly improved grassland with some semi-natural grassland and areas of arable land). There is the potential for short-term, temporary, indirect, construction phase impacts to six areas of ancient woodland that are in proximity to the existing line (Armagh, and Dungannon and South Tyrone). There is the potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities within the study area during the restring, being indirect interactions with 18 historic land use sites that have the potential to be contaminated (e.g., railway land, textile works and dye works, mineral workings, road vehicle fuelling), and one PPC site (Ballymagarney Road), which are in proximity (within 500 m) of the existing line. There is the potential for short-term, temporary, direct interactions with three areas of unstable ground comprised of peat, during the uprate, as the existing line crosses these areas, as well as one abandoned mine that is intersected by the existing line; this may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate.

Water

There is the potential for short-term, temporary, direct impacts, including sedimentation, pollution and damage to river banks, to two sections of river within the study area, which are crossed by the least cost line, during the undergrounding of cables through Killyman village. Cabling works have the potential for short-term, temporary, direct sedimentation and pollution impacts to one WFD river water body within the study area, River Rhone (Dungannon), which is of Moderate WFD ecological status. However, these risks could be avoided by maintaining good working practices during the construction phase. There is potential for difficult working conditions during construction or functioning of the proposed cable installation in areas of 1% AEP fluvial flood risk and 0.5% AEP pluvial flood risk that intersect or are in proximity to the least cost line.

There is the potential for short-term, temporary, direct impacts, including sedimentation, pollution and damage to river banks, to 26 sections of river within the study area, which are crossed by the existing line, during the construction phase of the Drumnakelly – Tamnamore 11 kV OHL restring. Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to seven WFD river water bodies within the study area, River Blackwater (Argory), Annagh River, Ballybay River, Tamnamore Stream, Tall River (Derrycrew), Kilmore Tributary, Lough Neagh Peripheral, all of which are of less than Good WFD ecological status. However, these risks could be avoided by maintaining good working practices during the restring. There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line. There is the potential for difficult working conditions during the construction of the restring where there are scattered areas of significant 0.5% AEP pluvial flood risk that are crossed by, or in proximity to, the existing line.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the 110 kV line.

Air

If the undergrounding of cable through Killyman village is developed within 1% of the best environmental line, there is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, in non-sensitive areas that are crossed by or in close proximity to this line, from the use of construction equipment during the cabling works.

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, within a sensitive area (the Armagh City, Banbridge and Craigavon Borough Council AQMA) that will be in close proximity to the construction works, from the use of construction equipment during the restring of the Drumnakelly – Tamnamore 110 kV OHL.

There are unlikely to be any further medium- or long-term negative impacts on local air emissions and reductions in local air quality within the study area following the cabling works and restring.

Climatic Factors

There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development as uprates are unintrusive and generally only involve agricultural type equipment moving across land, while the least cost line for the undergrounding of cables through Killyman village does not cross any significant areas of GHG sequestering vegetation.

There is the potential for short-term, temporary increases in local GHG emissions, in areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring, and during the cabling works through Killyman village. There is unlikely to be any further medium- or long-term increases in local GHG emissions within the study area following the uprating works.

There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP climate change fluvial flood risk associated with rivers that cross the existing line, particularly around the Annaghmore and Ardress areas. There is the potential for difficult working conditions during the construction of the restring where there are scattered areas of significant 0.5% AEP climate change pluvial flood risk that are crossed by, or in proximity to, the existing line. However, climate change fluvial and pluvial flood risk within this area is not significantly different from the current day scenario risk which is already scored under the Water section. Furthermore, ensuring that the 110 kV line infrastructure in these flood risk areas are resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

Material Assets & Infrastructure

If the undergrounding of cable through Killyman village substation is developed within the area of the least cost line, there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to one section of motorway, three sections of B class road, and one section of <4 m tarred road that intersect this area. There is the potential for short-term, temporary, direct, construction phase disturbance to agricultural lands (improved grassland and semi-natural grassland). There are unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to two sections of motorway, 12 sections of A road, 14 sections of B road, 27 sections of minor road and 35 sections of <4 m tarred roads, that intersect the existing Drumnakelly – Tamnamore 110 kV OHL or are in close proximity, during the restring. The North-West gas pipeline intersects the existing line at two locations. There are 15 existing 110 kV OHLS, and two existing 275 kV OHLs that intersect or are in proximity to the existing line. There is the potential for short-term, temporary, difficulties during construction in the areas in which this infrastructure is crossed by the 110 kV line that is to be uprated. There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land that are crossed by the existing 110 kV line, during the restring. There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

There is the potential for the development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit, with minimal disruption to other assets and infrastructure in the medium and long term.

Cultural, Architectural & Archaeological Heritage The least cost line for the undergrounding of cable through Killyman village intersects one Industrial Heritage site (a bridge), two Listed buildings (Killyman Rectory and St Andrew's Church), and one SMR site (Lenghagh Church and Graveyard on St Andrew's). If the cabling work is undertaken within close proximity to these sites there is the potential for direct, temporary to permanent, impacts on these sites, and for construction phase, temporary impacts on the setting of these features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the cabling works, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the transmission line. There is the potential for short-term, temporary, indirect, construction phase disturbance to 11 SMR sites, 31 Industrial Heritage sites, 22 Defence Heritage sites, and 12 listed buildings, which are all crossed by or in close proximity to the existing line Drumnakelly – Tamnamore 110 kV OHL. There is potential for short-term, temporary, direct or indirect disturbance to two listed Parks and Gardens (Ardress and The Argory), during the restring, which are crossed by or in close proximity to the existing line. There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring.
Landscape & Visual Amenity There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within two LCAs during the undergrounding of cables through Killyman village, Lough Neagh Peatlands LCA and Loughgall Orchard Belt LCA, which are of High sensitivity and Medium / High sensitivity to development, respectively. The undergrounding of the line through Killyman has the potential for positive impacts on the landscape and visual amenity of these areas in the medium- to long-term. There is potential for short-term, temporary, construction phase, negative landscape and visual effects to the National Trust Lands of Argory, which are intersected by the existing Drumnakelly – Tamnamore 110 kV OHL, and Ardress House, which is situated c. 500 m from the OHL. There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within two LCAs that are intersected by the existing OHL, Lough Neagh Peatlands LCA, and Loughgall Orchard Belt LCA, which are of High sensitivity and Medium / High sensitivity to development, respectively. There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting.
Additional Impacts Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply. A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area. There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F7. Ballylumford – Ballyvallagh Uprating – Project 7

Discussion of Potential Impacts
Biodiversity, Flora & Fauna

There is the potential for short-term, temporary, indirect sedimentation impacts, as well as short-term, temporary, noise and visual direct disturbance of designated bird species, of Larne Lough SPA, Ramsar site and ASSI that are intersected by the existing Ballylumford – Ballyvallagh OHL during the restring. There is potential for short-term, temporary, indirect, downstream sedimentation impacts to East Coast Marine pSPA, North Channel SAC, to Woodland West of Black Hill SLNCI, and to the Glynn / Glenoe River Upper Salmonid River, during the construction phase of the restring.

There is the potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the existing OHL.

There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the restring.

Construction of this restring has the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on Larne lough SPA, Larne Lough Ramsar, and East coast marine pSPA, along with disturbance and displacement impacts, on Larne lough SPA and Larne Lough Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the population within Mill Bay village, which is intersected by the existing Ballylumford – Ballyvallagh OHL, and to the local population that are within close proximity to the existing line in a low population density area, during the restring. There is not expected to be any potential for impacts on the population of any socially sensitive areas (e.g., Neighbourhood Renewal Areas, peace lines, or areas of lower perceived health), as there are none in the vicinity of the existing OHL.

There are unlikely to be any further medium- or long-term negative impacts to local populations following the development of the OHL restring.

Geology, Soils & Land use

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the existing line during the restring works, mainly being agricultural land (improved grassland and arable land), as well as coastal areas within Larne Lough, and small areas of broadleaf woodland.

There is the potential for short-term, temporary, indirect, construction phase impacts to Kilcoan ASSI designated for its geological features, to five areas of ancient woodland (Larne and Carrickfergus), and to one Forest Service land (Woodburn), that are in proximity to the existing line, during the restring.

There is the potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities within the study area during the restring, being direct interactions with two historic land use sites that have the potential to be contaminated (mineral workings) that intersect the existing OHL, and indirect interactions with 29 historic land use sites and one PPC site (Ballylumford Power Station) that are in proximity (within 500 m) to the OHL.

There is the potential for short-term, temporary, direct interactions with four upland areas, and three areas of unstable ground comprised of peat, during the uprate, as the existing line crosses or is in close proximity to these areas, as well as one area of landslide deposits and four abandoned mines that are in close proximity to the existing line; this may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate.

Water

There is the potential for short-term, temporary, direct or indirect impacts, including sedimentation, pollution and damage to river banks, to 86 sections of river within the study area, which are crossed by or in close proximity to the existing line, during the construction phase of the Ballylumford – Ballyvallagh OHL restring. Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to three WFD river water bodies within the study area, Copeland Water, Glynn River, and Kilroot River; of these, Kilroot River is of Good WFD ecological status, while Glynn River and Copeland Water are of Moderate status and Moderate ecological potential, respectively. Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to three transitional / coastal WFD water bodies, Larne Lough Mid, Larne Lough North and Larne Lough South, which are of Moderate status or Moderate ecological potential. Construction of the restring also has the potential for short-term, temporary, direct sedimentation and pollution impacts to three drinking water rivers, Copeland Water and Glynn River, and for short-term, temporary, direct sedimentation and pollution impacts to one (Magheramourne) and short-term, temporary, indirect sedimentation and pollution impacts to five (Barney's Point, Mill Bay, Off White Key, Outer Mill bay and White Quay) shellfish licenced areas. However, these risks could be avoided by maintaining good working practices during the restring.

There is the potential for difficult working conditions during the construction of the restring where there is an extensive area of significant 0.5% AEP coastal flood risk along Larne Lough as well as the Island Magee coastline, as well as where there are several areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line (including the Glenoe, Lough Mourne, Ballycarry and Browns Bay Road (Island Magee) areas) and where there are scattered areas of significant 0.5% AEP pluvial flood risk that are crossed by, or in proximity to, the existing line (including the Larne, Millbrook, Glenoe, Glynn, Beltoy, Ballycarry and Island Magee areas).

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the OHL.

Air

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, within non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the restring of the Ballylumford – Ballyvallagh OHL.

There are unlikely to be any further medium- or long-term negative impacts on local air emissions and reductions in local air quality within the study area following the restring.

Climatic Factors

There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development as uprates are unintrusive and generally only involve agricultural type equipment moving across land.

There is the potential for short-term, temporary increases in local GHG emissions, in areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring. There is unlikely to be any further medium or long term increases in local GHG emissions within the study area following the uprating works.

There is the potential for difficult working conditions during the construction of the restring where there is an extensive area of significant 0.5% AEP climate change coastal flood risk along Larne Lough as well as the Island Magee coastline, as well as where there are several areas of significant 1% AEP climate change fluvial flood risk associated with rivers that cross the existing line (including the Glenoe, Lough Mourne, Ballycarry and Browns Bay Road (Island Magee) areas) and where there are scattered areas of significant 0.5% AEP climate change pluvial flood risk that are crossed by, or in proximity to, the existing line (including the Larne, Millbrook, Glenoe, Glynn, Beltoy, Ballycarry and Island Magee areas). However, climate change fluvial and pluvial flood risk within this area is not significantly different from the current day scenario risk which is already scored under the Water section. Furthermore, ensuring that the OHL infrastructure in these flood risk areas is resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

Material Assets & Infrastructure

There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to one section of A road, 18 sections of B road, 17 sections of minor road, six sections of <4 m tarred roads, and two sections of railway line, that intersect the existing Ballylumford – Ballyvallagh OHL or are in close proximity, during the restring. The PNG gas transmission pipeline intersects the existing line at several locations. There are eight existing 110 kV OHLs, and five existing 275 kV OHLs that intersect or are in proximity to the existing line. There is the potential for short-term, temporary, difficulties during construction in the areas in which this infrastructure is crossed by the Ballylumford – Ballyvallagh OHL that is to be uprated.

There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land (improved grassland and arable land) that are crossed by the existing Ballylumford – Ballyvallagh OHL, during the restring. There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

There is the potential for the development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There is the potential for short-term, temporary, indirect, construction phase disturbance to 40 SMR sites, three Scheduled Zones (Church and graveyard, Enclosure with structure, and a Mound), 55 Industrial Heritage sites (e.g., Limestone Quarry and Limekiln, Bridge, Flax Mill Site) and 22 listed buildings, which are all crossed by or in close proximity to the existing line Ballylumford – Ballyvallagh OHL. There is potential for short-term, temporary, direct or indirect disturbance to one listed Parks and Gardens (Red Hall), during the restring, which is crossed by the existing line.

There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring.

Landscape & Visual Amenity

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within four LCAs that are intersected by the existing Ballylumford - Ballyvallagh OHL, Carrickfergus Farmed Escarpment LCA, Carrickfergus Upland Pastures LCA, Island Magee LCA and Larne Ridgeland LCA, all of which are of Medium / High sensitivity to development.

There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting.

Additional Impacts

Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F8. New NW 110 kV Switching Station – Project 8

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, construction phase, sedimentation and pollution impacts to the River Faughan and Tributaries SAC and ASSI, and associated species, in particular Otters *Lutra* lutra and Atlantic Salmon *Salmo salar*; and for construction phase disturbance of otter. Development of the new substation in proximity to this site should be avoided due to the sensitivity of the designated species.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, construction phase, sedimentation and pollution impacts to Lough Foyle SPA and Lough Foyle Ramsar site, and for short term, temporary, construction phase disturbance of designated bird species at these sites.

There is the potential for short-term, temporary, direct negative impacts on non-designated, semi-natural habitats within the study area, during the construction of the substation extension.

Construction of the new transmission line has the slight potential to create a new vector for invasive species or increase the rate of their spread; however, this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for habitat loss impacts on River Faughan SAC. There is also the potential for water quality and habitat deterioration impacts on River Faughan SAC, Lough Foyle SPA, and Lough Foyle Ramsar, along with disturbance and displacement impacts on River Faughan SAC, Lough Foyle SPA, and Lough Foyle Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is the potential for short-term, temporary, direct disturbance impacts, such as noise and dust, along with negative health impacts, to people in the eastern periphery of Derry / Londonderry and / or the southern part of Maydown settlement area, during the construction phase of the new substation.

There are unlikely to be any significant medium- and long-term negative health or disturbance impacts to people in the study area, in the operation of the substation extension.

There is the potential for short-, medium- and long-term, temporary and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the development of the substation extension.

Geology, Soils & Land use

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising improved grassland and semi-natural grassland, but also including small areas of arable land, and freshwater with associated broadleaf woodland running south to north through the centre of the study area.

There is one area of ancient woodland located in the south of the study area; this area should be avoided to minimise the potential of short-term, temporary, direct soil compaction and sedimentation impacts during construction, or short- to long-term permanent loss of this woodland area.

There are 28 historical land use areas that have the potential to be contaminated (e.g., City Industrial Waste, mineral workings, waste recycling, treatment and disposal sites), primarily located in the centre of the study area from south to north, and across its northern periphery. These sites should be avoided to prevent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area.

Water

If the new substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, indirect, construction phase sedimentation and pollution impacts to two sections of river that run south to north through the centre of the study area and partially avoided by the 50% lower sensitivity area (GBNI0201333 and UKGBNI0204148), to one WFD River, the River Faughan (Carmoney), which is of Moderate WFD status, and to one Drinking Water River, the River Faughan. However, the risk of these impacts can be minimised if there is a sufficient buffer zone between the new substation and these sections of river, and by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions and / or flooding of the new substation associated with areas of significant 1% AEP fluvial flood risk located along the course of the River Faughan; a significant area of 0.5% AEP coastal flood risk that encompasses a section of the River Faughan to the north and a water body located between the Mobuoy Road and the River Faughan; and several areas of significant 0.5% AEP pluvial flood risk within the study area, located around Lough Enagh (Eastern) and along the River Faughan, particularly to the east of the channel. Development of the new substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new / extended substation.

Air

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new substation associated with areas of significant 1% AEP climate change fluvial flood risk located along the course of the River Faughan; a significant area of 0.5% AEP climate change coastal flood risk that encompasses a section of the River Faughan to the north and a water body located between the Mobuoy Road and the River Faughan; and several areas of significant 0.5% AEP pluvial flood risk within the study area, located around Lough Enagh (Eastern) and along the River Faughan, particularly to the east of the channel. Development of the new substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area, there is the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the areas of broadleaf woodland along the margins of the River Faughan in the centre of the lower sensitivity area. To minimise the potential of these impacts, development of the new substation within these areas should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Material Assets & Infrastructure

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to sections of dual carriageway located in the north-west of the study area, or to sections of minor roads and < 4 M tarred roads that intersect the area.

There are twelve existing 110 kV OHLs, and two existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints. If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land, including improved grassland, semi-natural grassland, and arable land. If the new / extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area. There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.
Cultural, Architectural & Archaeological Heritage Within the 50% lower sensitivity area of the study area there are several known heritage sites, including 16 SMR sites (e.g., heavy anti-aircraft battery, burnt mound and associated spread, Bronze Age cremation), three Scheduled Zones (Green Island Crannog and Tower House, Rough Island Crannog, and Enagh Church and Graveyard), six listed buildings, three Industrial Heritage areas (Flax holes and a bridge), three Defence Heritage Areas, and one Park and Garden (Enagh House). Development of the new substation over, or in close proximity to, these sites have the potential for planning constraints as well as short-, medium- and long-term impacts on, or the setting of, these heritage features and should be avoided. If there is a sufficient buffer between these heritage sites and the new / extended substation, there are unlikely to be any significant short-, medium- or long-term impacts on these features or their settings within the study area, in the development and operation of the new substation.
Landscape & Visual Amenity If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to three Landscape Character Areas, Burnigibbagh and Drumahoe LCA, Foyle Valley LCA, and Lough Foyle Alluvial Plain LCA, all of which are of Medium / High sensitivity to development.
Additional Impacts Following the development of the new switching station, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply. A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time. There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new switching station.

F9. Coolkeeragh 110 kV Extension – Project 9

Discussion of Potential Impacts
Biodiversity, Flora & Fauna

If the extended substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short-, medium- and long-term, permanent loss of non-designated, semi-natural habitats.

Construction and operation of the substation is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

Population & Human Health

There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the substation redevelopment.

Geology, Soils & Land use

If the extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of small areas of several types of land use, primarily comprising urban land / hard surfaces, broadleaf woodland and some semi-natural grassland.

Water

There are no river segments of WFD water bodies within the 50% lower sensitivity area of wider study area, and no identified areas of flood risk. There are unlikely to be any short-, medium-, or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, during the construction phase and following the development of the extended substation.

Air

If the extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There are no areas of climate change flood risk identified within the 50% lower sensitivity are or the wider study area, and therefore there is not expected to be any potential for difficult working conditions.

If the extended substation is developed within the 50% lower sensitivity area within the study area there is the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the area of broadleaf woodland

in the north of the study area. To minimise the potential of these impacts, development of the extended substation within this area should be avoided, if possible. If the extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the substation extension.
Material Assets & Infrastructure If the extended substation is developed within the 50% lower sensitivity area there is no potential for construction phase disturbance impacts on any road network. There are nine existing 110 kV OHLs, and one existing 275 kV OHL that intersect the 50% lower sensitivity area; development of the extended substation within close proximity to these existing transmission lines has the potential for short term, temporary construction constraints. If the extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area. There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.
Cultural, Architectural & Archaeological Heritage There are unlikely to be any significant short-, medium- or long-term impacts on any known heritage features, or their setting, within the study area, in the development and operation of the new / extended substation, as there are no known heritage features in close proximity to the existing substation.
Landscape & Visual Amenity If the extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to one Landscape Character Area, Lough Foyle Alluvial Plain LCA, which is of Medium / High sensitivity to development.
Additional Impacts Following the development of the new substation extension, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply. A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time. There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation extension.

F10. Energising Belfast – Project 10

Discussion of Potential Impacts
Biodiversity, Flora & Fauna

If the new cabling and substation developments are built within the 50% lower sensitivity area, there is potential for short-term, temporary, construction phase, direct noise and visual disturbance of designated bird species, and short-term, temporary, construction phase, indirect sedimentation and pollution impacts to Belfast Lough SPA, Ramsar site and RSPB Reserve, Belfast Lough Open Water SPA, Inner Belfast Lough and Outer Belfast Lough ASSIs during the construction phase of the new transmission infrastructure.

There is the potential for direct short- or long-term direct (e.g., habitat loss or damage) or indirect (e.g., downstream sedimentation or pollution) impacts on habitats and species within SLNCIs that are intersected by the 50% lower sensitivity area (including Waterworks Park, Alexandra Park, Springfield Park / Highfield Glen, Upper Forth River, Bog Meadows, M1 / Falls Road, and Milltown Cemetery).

If the new transmission infrastructure is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, construction phase, direct disturbance and indirect sedimentation impacts to two Salmonid Rivers and associated species, namely the Forth River and Three Mile Water. Development of the new infrastructure in proximity to these rivers should be avoided due to the sensitivity of the species.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on Belfast Lough SPA, Belfast Lough Ramsar, and Belfast Lough Open Water SPA, along with disturbance and displacement impacts, on Belfast Lough SPA, Belfast Lough Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

If the new cabling and substation developments are built within the 50% lower sensitivity area, there is the potential for short-term, temporary, direct disturbance impacts, such as noise and dust, and indirect impacts such as construction related traffic management, to the population within four main settlements that are intersected by this high population density area, Belfast City, Greenisland, Castlereagh and Newtownabbey. There is the potential for short-term, temporary, indirect disturbance impacts within socially sensitive areas that are within the 50% lower sensitivity area, including nine Neighbourhood Renewal Areas (Upper Ardoyne Ballysillan, South West Belfast, Rathcoole, Inner South Belfast, Inner North Belfast, Inner East Belfast, Greater Shankill, Falls Clonard, and Crumlin Ardoyne), 13 peace lines (Serpentine Gardens, Newington Street, Longlands Road, Torrens, Roden Street, Lower Oldpark Cliftonville, Ardoyne Woodvale, Alliance Avenue, Short Strand, Alexandra Park, Duncairn Gardens, Falls and Shankill, and Henry Street), and areas of lower perceived health throughout the 50% least cost area, predominantly to the west of Belfast city centre and the docklands / harbours areas.

There is the potential for medium- to long-term negative impacts to populations in socially sensitive areas due to cumulative effects, following the construction works.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of a significant volume of secure and reliable electricity, to meet future needs of the population, following the construction of the new transmission line, from the provision of new transmission infrastructure.

Geology, Soils & Land use

If the new cabling and substation developments are built within the 50% lower sensitivity area, there is the potential for short-, medium- and long-term, permanent, direct loss of land use, primarily comprising urban / suburban land.

The small areas of ancient woodland (Castlereagh, Belfast and Newtownabbey) can be avoided by the 50% lower sensitivity area.

There is potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities within the 50% lower sensitivity area during the cabling and substation works. There is potential for short-term, temporary interaction with 787 historic land use areas that have the potential to be contaminated (e.g., military installations, road vehicle fuelling, dockyards and dockland, textile works and dye works, former railway lands), and 19 PPC sites. These sites should be avoided to prevent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area. There is the potential for short-term, temporary, direct interactions with three areas of upland topography, and two areas of landslide deposits, during the construction phase, that intersect the 50% lower sensitivity area; this may cause technical difficulties in development.

Water

If the new cabling and substation developments are built within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to six river WFD water are of less than Good ecological status. There is the potential for short-term, temporary, direct or indirect impacts, including sedimentation, pollution and damage to river banks to 76 sections of river within the study area, and to one drinking water river, the River Lagan. There is the potential for short-term, temporary, indirect sedimentation and pollution impacts to three WFD Transitional / Coastal water bodies, two of which are of Moderate ecological potential (Lagan Estuary and Belfast Harbour), and one of Moderate ecological status (Belfast Inner Lough), and to 13 Shellfish Licence areas located at Jordanstown, Newtownabbey, Off Greenisland, South Middle Back, West of Oyster Bank, Whiteabbey and Whitehouse Roads. The risk of these impacts can be minimised if there is a sufficient buffer zone between the new substation and cabling works and these sections of river, and by maintaining good working practices adjacent to water bodies.

There is the potential for difficult working conditions during cabling and substation construction and / or flooding of the new substations where there are several significant areas of 1% AEP fluvial flood risk within the 50% lower sensitivity area, including the Belfast Harbour, River Lagan, Newtownabbey, Knockbreda, Castlereagh and Newtownbreda areas; areas with significant areas of 0.5% AEP coastal flood risk located within the Belfast Harbour area, extending up the coastline towards Whiteabbey, and the River Lagan up to Belvoir Park Forest; and areas with significant 0.5% AEP pluvial flood risk widespread across the 50% least cost area, located throughout the Belfast area as well as extending up the coast to the Newtownabbey and Whiteabbey areas. Development of new substations and cabling works in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts.

Air

If the new transmission infrastructure is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, including within five sensitive air quality management areas (Belfast AQMA No.1, Belfast AQMA No.2, Belfast AQMA No.3, Belfast AQMA No.4, and AQMA No.3 (Elmfield)) that could be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions during cabling and substation construction and / or flooding of the new substations where there are several significant areas of 1% AEP climate change fluvial flood risk within the 50% lower sensitivity area, including the Belfast Harbour, River Lagan, Newtownabbey, Knockbreda, Castlereagh and Newtownbreda areas; areas with significant areas of 0.5% AEP climate change coastal flood risk located within the Belfast Harbour area, extending up the coastline towards Whiteabbey, and the River Lagan up to Belvoir Park Forest; and areas with significant 0.5% AEP climate change pluvial flood risk widespread across the 50% least cost area, located throughout the Belfast area as well as extending up the coast to the Newtownabbey and Whiteabbey areas. Development of new substations and cabling works in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts.

If the transmission works are developed within the 50% lower sensitivity area within the study area has the potential for short, medium and long term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed across the areas of broadleaf forest in the north-western or southern areas of the lower sensitivity area within the outer extents of Belfast city. To minimise the potential of these impacts, development of new transmission infrastructure within these areas should be avoided.

If the new transmission infrastructure is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new transmission infrastructure.

Material Assets & Infrastructure

If the new substations and cabling works are developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to a significant amount of road and rail network (720 road sections in total), comprising areas of motorway, dual carriageway, A class road, B class road, minor roads, <4 m tarred roads, and passenger and siding railway line, that intersect the study area and the lower sensitivity area. There is the potential for short term, temporary, direct, construction phase disturbance impacts, such as increased construction related traffic, in the vicinity of Belfast City Airport if the new transmission infrastructure is developed in this area.

There are 208 existing 110 kV OHLs, and four existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new transmission infrastructure within close proximity to these existing transmission lines has the potential for short term, temporary construction constraints.

If the new transmission infrastructure is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, agricultural pasture lands (improved grassland and semi-natural grassland) within the north-west and south of the study area.

If the new transmission infrastructure is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within the 50% lower sensitivity area of the study area there are 1593 listed buildings, 729 Industrial Heritage assets, 142 SMR sites, 30 Scheduled Zones, and 116 Defence Heritage records. If the new / extended substation is developed within close proximity to these sites there is the potential for direct short-term to permanent impacts on these sites, and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new transmission infrastructure, there are unlikely to be any significant short, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new transmission infrastructure.

If the cabling work or new substation construction is undertaken within close proximity to the Area of Archaeological Potential that is located in the centre of the study area and 50% lower sensitivity area, there is the potential for direct, temporary to permanent, impacts on this site, and therefore this should be avoided.

There are also 11 listed Parks and Gardens intersected by the 50% lower sensitivity area (Belvoir (Forest Park), Cranmore Drumglass, Stranmilllis House (College), Group of Contiguous sites, Botanic Gardens Park, Ormeau Park, Dunville Park, Alexandra Park, Belfast Castle, and Bellevue (Belfast Zoo)). If new substations are developed within, or in close proximity to, these sites, there is the potential for short-term to permanent direct impacts and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If new cabling works are undertaken within, or in close proximity to, these sites, there is the potential for short-term, temporary direct

impacts during construction and / or permanent impacts on the setting of these sites. If there is a sufficient buffer between these heritage sites and the transmission infrastructure, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new transmission infrastructure.

Landscape & Visual Amenity

If new substations are developed within the 50% lower sensitivity area of the study area, there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects primarily within the Belfast / Lisburn LCA, which is of Medium / High sensitivity, however this is likely to be a slight impact in terms of the nature of the already built-up area. If underground cabling works are undertaken, there is the potential for short-term, temporary, negative landscape and visual effects within this LCA.

The National Trust Land of Crown is avoided by the 50% lower sensitivity area, and there are not expected to be any impacts on this site.

Additional Impacts

Following the development of the new transmission infrastructure, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new transmission infrastructure take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new transmission infrastructure.

F11. Eden – Carnmoney Reinforcement – Project 11

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is the potential for short-term, temporary, noise and visual disturbance of designated bird species, and for short-term, temporary, indirect, downstream sedimentation impacts to Belfast Lough SPA and Ramsar site, Outer Belfast Lough ASSI, and Belfast Lough Open Water SPA, that are in proximity to the existing OHL in the rural area between Carnmoney and Carrickfergus, during the restring of the existing OHL. There is the potential for short-term, temporary, direct or indirect impacts within Knockagh – Dorisland SLNCI, and for short-term, temporary, indirect, downstream sedimentation impacts to Jointure Bay Stream SLNCI and Three Mile Water SLNCI, and to two Salmonid Rivers, Three Mile Water and Woodburn River, during the restring of the existing OHL.

If the undergrounding of cables is undertaken within 1% of the best environmental line in Carnmoney and Carrickfergus, there is the potential for short-term, temporary, noise and visual disturbance of designated bird species, and for short-term, temporary, indirect, downstream sedimentation impacts to Belfast Lough SPA and Ramsar site, Outer Belfast Lough ASSI, and Belfast Lough Open Water SPA. There is the potential for short-term, temporary, direct (e.g., habitat loss or damage) or indirect (e.g., downstream sedimentation or pollution) impacts within Knockagh – Dorisland SLNCI within 1% of the best environmental line around Carnmoney, and for short-term, temporary, direct or indirect impacts within South Woodburn SLNCI around Carrickfergus. There is the potential for short-term, temporary, direct or indirect impacts to two Salmonid Rivers, Three Mile Water and Woodburn River, during the undergrounding of cables within Carnmoney and Carrickfergus.

There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the restring of the

existing OHL and undergrounding of cables within Carnmoney and Carrickfergus. There is the potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the existing OHL and the underground cabling route. Construction of this restring and underground cabling have the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on Belfast Lough SPA, Belfast Lough Ramsar, and Belfast Lough Open Water SPA, along with disturbance and displacement impacts, on Belfast Lough SPA, Belfast Lough Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the high population density areas within Metropolitan Newtownabbey (Carnmoney) and Carrickfergus during the undergrounding of cables within Carnmoney and Carrickfergus, including within areas of lower perceived health around Newtownabbey and Carrickfergus.

There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the local population that are within close proximity to the existing line in the lower population density rural area between Carnmoney and Carrickfergus and in proximity to the settlements of Greenisland and Trooperslane, during the restring of the existing OHL.

There are unlikely to be any further medium- or long-term negative impacts to local populations following the development of the restring and the undergrounding of cables.

Geology, Soils & Land use

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the 1% least cost line for the undergrounding of cables through Carnmoney and Carrickfergus, mainly being suburban / urban land and agricultural land (semi-natural grassland, improved grassland, and arable land), with small areas of broadleaf woodland. There is the potential for short-term, temporary, indirect, construction phase impacts to one long-established ancient woodland (Carrickfergus) that is within 1% of the best environmental line in Carrickfergus.

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the existing line during the restring works, mainly being agricultural land (predominantly arable land with some semi-natural grassland), with small areas of broadleaf woodland that intersect the existing OHL.

There is the potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities within the study area during the restring, being indirect interactions with 13 historic land use sites (e.g., waste recycling, textile works and dye works, mineral workings, railway land), and two PPC sites (Old Carrick Road and Dorisland WTW), which are all in proximity (within 500 m) of the existing line; 21 and nine historic land use sites that are within 1% of the best environmental line for the undergrounding of cables in Carnmoney and Carrickfergus, respectively. Works crossing these sites in the short-term could lead to temporary or permanent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area; therefore, this should be avoided if possible.

There is the potential for short-term, temporary, direct interactions with one area of upland topography, one area of landslide deposits, and four abandoned mines, during the uprate of OHL and undergrounding of cables, as the existing line or 1% best environmental line, crosses these areas; this may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate and undergrounding of cables.

Water

There is the potential for short-term, temporary, direct impacts, including sedimentation, pollution and damage to river banks, to 33 sections of river within the study area, which are crossed by the existing line or are within 1% of the best environmental line, during the construction phase of the restring and undergrounding of cables. Construction of the restring and undergrounding of cables has the potential for short-term, temporary, sedimentation and pollution impacts to four WFD river water bodies, of which two are of Moderate WFD status (Ballymartin River and Three Mile Water), and two are of Moderate ecological potential (Woodburn River and Copeland Water), and to one drinking water river (Woodburn River) within the study area. However, these risks could be avoided or minimised by maintaining good working practices during the restring and cabling works.

There is the potential for difficult working conditions during the construction of the restring and undergrounding of cables where there are small areas of significant 0.5% AEP pluvial flood risk, primarily associated with rivers, that intersect these areas.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the 110 kV line.

Air

If the underground cabling works are undertaken within 1% of the best environmental line in Carnmoney and Carrickfergus, there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to these construction works, and within close proximity to non-sensitive areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the development of the new transmission infrastructure and restring. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

If the underground cabling within Carnmoney and Carrickfergus is developed within 1% of the best environmental line, there are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development, as the land use is predominantly suburban / urban and agricultural. There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from the uprating of existing OHL in the rural are between Carnmoney and Carrickfergus, as uprates are unintrusive and generally only involve agricultural type equipment moving across land.

There is the potential for short-term, temporary increases in local GHG emissions, in areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring and the undergrounding of cables. There is unlikely to be any further medium- or long-term increases in local GHG emissions within the study area following these works.

There is the potential for difficult working conditions during the construction of the restring and undergrounding of cables where there are small areas of significant 0.5% AEP climate change pluvial flood risk, primarily associated with rivers, that intersect these areas.

Material Assets & Infrastructure

If the underground cabling within Carnmoney and Carrickfergus is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to five sections of B class road, two sections of minor road, and one section of <4 m tarred road that intersect this area. There is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to one section of B class road, one section of minor road, and one section of <4 m tarred road that that intersect the existing OHL during the restring.

There are no existing OHLs within 1% of the best environmental line or the uprate area apart from the OHL to be uprated. The PNG gas transmission pipeline crosses the existing OHL. There is the potential for short-term, temporary, difficulties during construction in the areas in which this

infrastructure is crossed by the 110 kV line that is to be uprated. There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land that are crossed by the existing 110 kV line, during the restring. There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

There is the potential for the development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit, with minimal disruption to other assets and infrastructure in the medium and long term.

Cultural, Architectural & Archaeological Heritage

There is the potential for short-term, temporary, indirect, construction phase disturbance to four Scheduled Zones (rath, mound, church ruins and graveyard, and WW11 storage buildings), 25 SMR sites (e.g., enclosures, raths, standing stones), 20 Industrial Heritage sites (e.g., bridge, milepost, Cotton Print Mill), four Defence Heritage sites, and 10 listed buildings, which are all crossed by or in close proximity to the existing line 110 kV OHL, during the restring; and to one Scheduled Zone (WW11 Storage buildings), one SMR site (WW11 Storage buildings), one Industrial Heritage site (a bridge), and three Defence Heritage sites, that are within 1% of the best environmental line for the undergrounding of cables. There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring. If the cabling work is undertaken within close proximity to heritage sites there is the potential for direct, temporary to permanent, impacts on these sites, and for construction phase, temporary impacts on the setting of these features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the cabling works, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the transmission line.

Landscape & Visual Amenity

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within four Landscape Character Areas during the undergrounding of cables within Carnmoney and Carrickergus and the uprating of the existing OHL, of which one is of High sensitivity (Carrickfergus Farmed Escarpment LCA), and three are of Medium / High sensitivity (Carrickfergus Shoreline LCA, Carrickfergus Upland Pastures LCA, and Three and Six Mile Water Valleys LCA) to development.

There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting. The undergrounding of the line through Carnmoney and Carrickfergus has the potential for positive impacts on the landscape and visual amenity of these areas in the medium- to long-term.

Additional Impacts

Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F12. Coolkeeragh – Killymallaght – Strabane 110 kV Uprating – Project 12

Discussion of Potential Impacts
Biodiversity, Flora & Fauna There is the potential for short-term, temporary, direct and indirect disturbance of habitats and species within the River Faughan and Tributaries SAC and ASSI, which intersects the existing OHLs, during the restring, in particular to Atlantic salmon and otter, for short-term, temporary, indirect sedimentation or pollution impacts to this site, and for short-term, temporary noise and visual disturbance of otter. There is the potential for short-term, temporary, indirect, downstream sedimentation or pollution impacts to the River Foyle and Tributaries SAC and ASSI, to the River Finn SAC (transboundary in the RoI), the River Foyle, Mongavlin to Carigans pNHA (transboundary in the RoI), and to Lough Foyle SPA, Ramsar site and ASSI, and for short-term, temporary, noise and visual disturbance of designated bird species within Lough Foyle SPA, Ramsar site and ASSI. There is the potential for short-term, temporary, indirect, downstream sedimentation or pollution impacts to five Salmonid Rivers that are crossed by the existing Coolkeeragh – Killymallaght - Strabane OHLs: Burn Dennet Lower, Burngibbagh, Glenmornan River, River Faughan Lower and River Faughan Lower Middle, during the construction phase of the restring. There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the restring. There is the potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the existing Coolkeeragh – Killymallaght - Strabane OHL. Construction of this restring has the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction. The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on River Finn SAC, Lough Foyle SPA, Lough Foyle Ramsar, and River Faughan and tributaries SAC, along with disturbance and displacement impacts, on Lough Foyle SPA and Lough Foyle Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.
Population & Human Health There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the local population of a relatively high-density area, including within four settlements that are intersected by the existing Coolkeeragh – Killymallaght - Strabane OHLs, Artigarvan, Ballymagorry, Derry / Londonderry City and Donagheady. There is the potential for short-term, indirect, construction phase disturbance to the population within socially sensitive areas, including within a Neighbourhood Renewal Area at the Waterside, a peaceline at Lower Tullynally, and areas of lower perceived health within Artigarvan and the area surrounding Drumahoe, which are in proximity to the existing OHLs. There are unlikely to be any further medium- or long-term negative impacts to local populations following the development of the OHL restring.
Geology, Soils & Land use There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the existing line during the restring works, mainly being agricultural land (improved grassland and semi-natural grassland), as well as urban / suburban land around the settlements, and small areas of arable land, and broadleaf woodland.

There is the potential for short-term, temporary, direct, construction phase impacts to four long-established ancient woodlands in Strabane and Derry / Londonderry, which are crossed by the existing line, and for short-term, temporary, indirect, construction phase impacts to 13 additional areas of ancient woodland (Strabane and Derry / Londonderry), that are in proximity to the existing line.

There is the potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities within the study area during the restring, being direct interaction with 16 historic land use sites (e.g., military installations, textile works and dye works, mineral workings, tarry waste, railway land) that are crossed by the existing line, and indirect interactions with 107 additional historic land use sites, and five PPC sites (e.g., quarry, renewable energy and other energy sites), which are all in proximity (within 500 m) of the existing line.

There is the potential for short-term, temporary, indirect interactions with two areas of uplands, one area of unstable ground comprising peat, and one quarry, that are in close proximity to the existing line, during the restring; these may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate.

Water

There is the potential for short-term, temporary, direct or indirect impacts, including sedimentation, pollution and damage to river banks, to 94 sections of river within the study area, which are crossed by or in close proximity to the existing line, during the construction phase of the Coolkeeragh – Killymallaght - Strabane restring. Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to five WFD river water bodies within the study area, Burngibbagh, Sandville Burn, Burn Dennet River, Glenmornan River and Faughan River (Carnmoney); of these, one is of Good WFD ecological status (Burngibbagh), with the remainder of Moderate ecological status, and to one transitional / coastal WFD water body, Foyle Harbour and Faughan, which is of Moderate ecological potential. Construction of the restring also has the potential for short-term, temporary, direct sedimentation and pollution impacts to two drinking water rivers that are crossed by the existing OHL, Burngibbagh and River Faughan. However, these risks could be avoided by maintaining good working practices during the restring.

There is the potential for difficult working conditions during the construction of the restring where there are several areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line, including the River Foyle. There is the potential for difficult working conditions during the construction of the restring where there are widespread areas of significant 0.5% AEP pluvial flood risk that are crossed by, or in proximity to, the existing line, including within the Derry / Londonderry, Ballymagorry, Artigarvin, Drumahoe, Milltown Burndennet and Cloghcor areas.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the Coolkeeragh – Killymallaght - Strabane OHL.

Air

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, within non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the restring of the Coolkeeragh – Killymallaght - Strabane OHL.

There are unlikely to be any further medium- or long-term negative impacts on local air emissions and reductions in local air quality within the study area following the restring. There is the potential for medium- and long-term, slight reductions in national air emissions and improvement to air quality, owing to the increased renewable energy connection.

Climatic Factors

There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development as uprates are unintrusive and generally only involve agricultural type equipment moving across land.

There is the potential for difficult working conditions during the construction of the restring where there are several areas of significant 1% AEP climate change fluvial flood risk associated with rivers that cross the existing line, including the River Foyle. There is the potential for difficult working conditions during the construction of the restring where there are widespread areas of significant 0.5% AEP climate change pluvial flood risk that are crossed by, or in proximity to, the existing line, including within the Derry / Londonderry, Ballymagorry, Artigarvin, Drumahoe, Milltown Burndennet and Cloghcor areas. However, climate change fluvial and pluvial flood risk within this area is not significantly different from the current day scenario risk which is already scored under the Water section. Furthermore, ensuring that the OHL infrastructure in these flood risk areas is resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

There is the potential for short-term, temporary increases in local GHG emissions, in areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring. There is unlikely to be any further medium or long term increases in local GHG emissions within the study area following the uprating works. However, operation of the uprated line has the potential for medium- and long-term, slight reductions in national GHG emissions owing to the increased renewable energy connection.

Material Assets & Infrastructure

There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to four sections of dual carriageway, 14 sections of A road, 19 sections of B road, 91 sections of minor road, and 52 sections of <4 m tarred roads, that intersect the existing Coolkeeragh – Killymallaght - Strabane OHL or are in close proximity, during the restring. There are 20 existing 110 kV OHLs that intersect or are in proximity to the existing line. There is the potential for short-term, temporary, difficulties during construction in the areas in which this infrastructure is crossed by the Coolkeeragh – Killymallaght - Strabane OHL that is to be uprated.

There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land (primarily improved grassland and semi-natural grassland) that are crossed by the existing Coolkeeragh – Killymallaght - Strabane OHL, during the restring. There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

There is the potential for the development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There is the potential for short-term, temporary, indirect, construction phase disturbance to 57 SMR sites, eight Scheduled Zones (e.g., WW2 ammunition bunkers, crannog, tombs, church and graveyard), 140 Industrial Heritage sites (e.g., Bridges, Flax Mill Sites, Mill Buildings, Kilns), 88 Defence Heritage assets, and 219 listed buildings, which are all crossed by or in close proximity to the existing Coolkeeragh – Killymallaght - Strabane OHL. There is potential for short-term, temporary, direct or indirect disturbance to three listed Parks and Gardens (Ashbrook, Beech Hill (Skipton Hall), and Enagh House), during the restring, which are crossed by the existing line.

There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring.

Landscape & Visual Amenity

There is the potential for short-term, temporary, indirect, construction phase, negative landscape and visual effects on the Sperrin AONB, which is in proximity to the existing Coolkeeragh – Killymallaght – Strabane OHL.

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within four LCAs that are intersected by the existing Coolkeeragh – Killymallaght – Strabane OHL, the Sperrin Foothills LCA, Foyle Valley LCA, Burngibbagh and Drumahoe LCA, and Loughermore Hills LCA, of which the Sperrin Foothills LCA is of High sensitivity, the Foyle Valley

LCA and Burngibbagh and Drumahoe LCA are of High / Medium sensitivity, and the Loughermore Hills LCA is of Medium / Low sensitivity to development.

There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting.

Additional Impacts

Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F13. Omagh – Strabane 110 kV Uprating – Project 13

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is the potential for short-term, temporary, direct and indirect disturbance of habitats and species within the Owenkillew River SAC and ASSI, which intersects the existing OHL, during the restring, in particular to freshwater pearl mussel, Atlantic salmon, otter and Ranunculus habitat, for short-term, temporary, indirect sedimentation or pollution impacts to this site, and for short-term, temporary noise and visual disturbance of otter.

There is the potential for short-term, temporary, direct and indirect disturbance of habitats and species within the River Foyle and Tributaries SAC and ASSI, which intersects and is downstream of the existing OHL, during the restring, in particular to Atlantic salmon, otter and Ranunsulus habitat, for short-term, temporary, indirect sedimentation or pollution impacts to this site, and for short-term, temporary noise and visual disturbance of otter.

There is the potential for short-term, temporary, indirect disturbance of habitats and species within Tully Bog SAC and ASSI, Grange Wood ASSI and Strabane Glen ASSI, all of which are in close proximity to the existing Omagh – Strabane OHL.

There is the potential for short-term, temporary, indirect, downstream sedimentation or pollution impacts to eight Salmonid Rivers that are crossed by the existing Omagh – Strabane OHL: Camowen River Lower, Cappagh Burn, Douglas Burn Foyle, Drumragh River, Glenscollip Burn, Owenkillew River Lower, Fairy Water Lower, and Strule River Lower, during the construction phase of the restring.

There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the restring.

There is the potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the existing Omagh – Strabane OHL.

Construction of this restring has the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for habitat loss impacts on River Foyle and tributaries SAC. There is also the potential for water quality and habitat deterioration impacts on River Foyle and tributaries SAC and River Finn SAC, along with

disturbance and displacement impacts on River Foyle and tributaries SAC. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the local population of a relatively high density area, including within four settlements that are intersected by the existing Omagh – Strabane OHL, Omagh town, Strabane, Mountjoy, and Ballymagorry, and within three additional settlements that are in close proximity to the line, Gillygooly, Newtownstewart, and Douglas Bridge. There is the potential for short-term, indirect, construction phase disturbance to the population within socially sensitive areas, including two Neighbourhood Renewal Areas, Omagh and Strabane, and areas of lower perceived health around Omagh and Strabane, which are in proximity to the existing OHL.

There are unlikely to be any further medium- or long-term negative impacts to local populations following the development of the OHL restring.

Geology, Soils & Land use

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the existing line during the restring works, mainly being agricultural land (improved grassland and semi-natural grassland), as well as areas of built up land around the settlements, and small areas of arable land, broadleaf woodland, and mountain heath and bog.

There is the potential for short-term, temporary, direct, construction phase impacts to two long-established ancient woodlands in Strabane, which are crossed by the existing line, and for short-term, temporary, indirect, construction phase impacts to 43 additional areas of ancient woodland (Strabane and Omagh), and three Forest Service lands (Gortin Glen and Ligfordrum), that are in proximity to the existing line.

There is the potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities within the study area during the restring, being direct interaction with five historic land use sites (textile works and dye works, mineral workings, ceramics, cement and asphalt manufacturing works) that are crossed by the existing line, and indirect interactions with 90 additional historic land use sites (e.g., railway land, textile works and dye works, mineral workings, road vehicle fuelling), and three PPC sites (Omagh Meats, Silver Hill Foods, and Fane Valley Feeds), which are all in proximity (within 500 m) of the existing line.

There is the potential for short-term, temporary, direct interactions with one area of uplands and one area of unstable ground comprising peat that are crossed by the existing OHL, and two further areas of uplands, one further area of unstable land comprising peat, and one quarry, that are in close proximity to the existing line, during the restring; these may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate.

Water

There is the potential for short-term, temporary, direct or indirect impacts, including sedimentation, pollution and damage to river banks, to 169 sections of river within the study area, which are crossed by or in close proximity to the existing line, during the construction phase of the Omagh – Strabane OHL restring. Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to 12 WFD river water bodies within the study area, Camowen River (Omagh), Cappagh Burn, Cavanalee River, Douglas Burn (Foyle), Drumragh River, Fairywater River (Dunwish), Glenknock River, Glenmornan River, Glenscollip Burn, Mourne River, Owenkillew River (Killymore) and Strule River; of these, three are of Good WFD ecological status (Owenkillew River, Douglas Burn and Glenknock), with the remainder of Moderate, or less than Moderate, status. Construction of the restring also has the potential for short-term, temporary, direct sedimentation and pollution impacts to four drinking water rivers that are crossed by the existing OHL, Camowen River, Cavanalee River, Glenscollip Burn and Mourne River. However, these risks could be avoided by maintaining good working practices during the restring.

There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line, including the Strabane, Omagh, Newtownstewart and Sion Mills areas. There is the potential for difficult working conditions during the construction of the restring where there are widespread areas of significant 0.5% AEP pluvial flood risk that are crossed by, or in proximity to, the existing line, including the Strabane, Omagh, Newtownstewart and Sion Mills areas.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the Omagh – Strabane OHL.

Air

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, within non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the restring of the Omagh – Strabane OHL.

There are unlikely to be any further medium- or long-term negative impacts on local air emissions and reductions in local air quality within the study area following the restring. There is the potential for medium- and long-term, slight reductions in national air emissions and improvement to air quality, owing to the increased renewable energy connection.

Climatic Factors

There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development as uprates are unintrusive and generally only involve agricultural type equipment moving across land.

There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line, including the Strabane, Omagh, Newtownstewart and Sion Mills areas. There is the potential for difficult working conditions during the construction of the restring where there are widespread areas of significant 0.5% AEP pluvial flood risk that are crossed by, or in proximity to, the existing line, including the Strabane, Omagh, Newtownstewart and Sion Mills areas. However, climate change fluvial and pluvial flood risk within this area is not significantly different from the current day scenario risk which is already scored under the Water section. Furthermore, ensuring that the OHL infrastructure in these flood risk areas is resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

There is the potential for short-term, temporary increases in local GHG emissions, in areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring. There is unlikely to be any further medium- or long-term increases in local GHG emissions within the study area following the uprating works. However, operation of the uprated line has the potential for medium- and long-term, slight reductions in national GHG emissions owing to the increased renewable energy connection.

Material Assets & Infrastructure

There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to 17 sections of A road, 45 sections of B road, 85 sections of minor road, and 118 sections of <4 m tarred roads, that intersect the existing Omagh – Strabane OHL or are in close proximity, during the restring. There are 26 existing 110 kV OHLs that intersect or are in proximity to the existing line. There is the potential for short-term, temporary, difficulties during construction in the areas in which this infrastructure is crossed by the Omagh – Strabane OHL that is to be uprated.

There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land (primarily improved grassland and semi-natural grassland) that are crossed by the existing Omagh – Strabane OHL, during the restring. There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

There is the potential for the development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There is the potential for short-term, temporary, indirect, construction phase disturbance to 51 SMR sites, eight Scheduled Zones (raths, tombs, and a boulder with hollows), 90 Industrial Heritage sites (e.g., Bridges, Flax Mill Sites, crossings, mileposts), two Defence Heritage assets, and 186 Listed Buildings, which are all crossed by or in close proximity to the existing Omagh – Strabane OHL. There is potential for short-term, temporary, direct or indirect disturbance to one listed Parks and Gardens (Moyle House), during the restring, which is crossed by the existing line.

There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring.

Landscape & Visual Amenity

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within the Sperrin AONB, which intersects part of the existing Omagh – Strabane OHL.

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within five LCAs that are intersected by the existing Omagh – Strabane OHL, Bessy Bell and Gortin LCA, Camowen Valley LCA, Foyle Valley LCA, Omagh Farmland LCA and Sperrin Mountains LCA, of which Bessy Bell and Gortin LCA, and Sperrin Mountains LCA are of High sensitivity, and the rest are of Medium / High sensitivity to development.

There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting.

Additional Impacts

Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F14. Mid Antrim Upgrade – Project 14

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line, there is the potential for short-term to permanent, direct (e.g., habitat loss or degradation) or indirect (e.g., sedimentation, pollution or disturbance) impacts on one SLNCI, Drumbolcan, that is intersected by the northern section of the lower sensitivity corridor. There is the potential for short-term indirect sedimentation or pollution) impacts on supporting habitat within Lough Neagh and Lough Beg SPA, Ramsar site c. 3.5 km to the south-west owing to potential hydrological connectivity. Lough Beg is also an ASSI, NNR and a RSPB Reserve. There is the potential for short-, medium- and long-term, permanent loss of non-designated, semi-natural habitats in the construction of the new transmission line.

There is potential for short-term, temporary, direct disturbance and indirect sedimentation impacts to one Salmonid River, namely River Maine Lower, and associated species, during the restring works of the Kells - Terrygowan 110 kV double circuit OHL, as the existing line crosses this river, and potential for short-term, temporary, indirect sedimentation or pollution impacts to Lough Neagh and Lough Beg SPA and Salmonid Lake, and Ramsar site, c. 7.5 km and 4.5 km from the existing OHL. There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the 110 kV circuits restring.

If the new Terrygowan substation is built within the 50% lower sensitivity area, there is no potential for direct short- or long-term impacts on any habitat or biodiversity designations that are within the wider study area. If the new / extended substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short, medium and long term, permanent loss of non-designated, semi-natural habitats.

Construction of the new transmission line and substation has the slight potential to create a new vector for invasive species or increase the rate of their spread; however, this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on Lough Neagh & Lough Beg SPA and Lough Neagh & Lough Beg Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line, there is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the new line in a relatively low density population area, including the population within one settlement, Rasharkin, which has a mean population density of 2.5 people / km^2. There is no potential for impacts on the population within any socially sensitive areas. There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

The uprate of the Kells - Terrygowan 110 kV double circuit OHL has the potential for short-term, temporary, indirect, construction phase, disturbance impacts, such as noise and dust, to the local population that are within close proximity to the new line in a low-density population area, and within areas of lower perceived health surrounding the Kells area. There are unlikely to be any further medium- or long-term negative impacts to local populations following the uprate works.

If the new Terrygowan substation is built within the 50% lower sensitivity area, there is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area. There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the new substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the development of the new transmission line, uprating works and substation development.

Geology, Soils & Land use

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line, there is the potential for short-term, temporary, direct, construction phase impacts, such as soil compaction or destabilisation, current land use disruption and loss of crops, to several types of land uses which may be crossed by the new line, mainly being agricultural areas (primarily improved grassland and with some semi-natural grassland and arable land), with small areas of broadleaf woodland and mountain, heath and bog. There is also the potential for direct loss or indirect damage within three areas of ancient woodland in the Ballymena area (of which two have been lost). There are seven potentially historically contaminated sites in the area that is within 1% of the best environmental line (e.g., mineral workings, textile works and dye works, and sewage works); works crossing these sites in the short-term could lead to temporary or permanent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area; therefore, this should be avoided if possible. There is the potential for difficult working conditions during construction and maintenance works owing to topography within three areas of uplands that intersect the east of the lower cost corridor, and within four areas of unstable land comprising peat that intersect parts of the corridor; therefore, these areas should be avoided, if possible.

The uprate of the Kells - Terrygowan 110 kV double circuit OHL has the potential for short term, temporary, direct impacts to land uses within the study area that are crossed by the existing line, predominantly being agricultural land (improved grassland) with a small area of broadleaf woodland, during the restring works. There is the potential for short-term, temporary, indirect, construction phase impacts to five areas of ancient woodland (Antrim), which are all in close proximity to the existing line. There is the potential for short term, temporary, direct interaction with one potentially hazardous soils and activities (waste recycling) that crosses the existing line during the restring, as well as the potential for short-term, temporary, indirect interaction with ten other sites of this type (e.g., railway land, road vehicle fuelling, waste recycling and power stations). There is the potential for short-term, temporary, direct interactions with one upland area at the eastern extent of the uprate area, and with three areas of unstable ground area comprising peat in the vicinity of the line in the centre of the uprate area, during the uprate, which may cause technical difficulties in development. There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate.

If the new Terrygowan substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of small areas of several types of land use, primarily comprising improved grassland, and some semi-natural grassland. There is no potential for interaction with any potentially hazardous sites or difficult working conditions during construction and maintenance works owing to topography within this area.

Water

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks to 75 sections of river that intersect this area, and the potential for short term, temporary, direct or indirect, construction phase sedimentation and pollution impact to five WFD river water bodies that intersect the area: Ahoghill Burn, Culmore River, Lower River Bann (Kilrea), River Maine (Randalstown) and River Maine (Slaght), all of which are of less than Good WFD status (Moderate or Moderate Ecological Potential status). However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new transmission line and these sections of river, where possible, and by maintaining good working practices in the construction of the new transmission line in proximity to water bodies. There is the potential for difficult working conditions during the construction of the new line, where there are several small areas of significant 1% AEP fluvial flood risk, and significant 0.5% AEP pluvial flood risk that are intersected by the area comprising 1% of the best environmental line, particularly towards Rasharkin, Portglenone and Ahoghill. Development of the new infrastructure in these areas should be avoided to minimize the risk of these impacts.

There is the potential for short-term, temporary, direct impacts, including sedimentation, pollution and damage to river banks, to 28 sections of river within the study area, which are crossed by the existing line, during the construction phase of the restring. Development of the restring has the potential for short-term, temporary, direct, construction phase sedimentation and pollution impact to four WFD river water bodies of Moderate WFD ecological status, namely the Connor Burn, Kells Water (Kells), River Maine (Randalstown), and Sharvogues Burn. However, the potential for these

risks can be minimised by maintaining good working practices during the restring. There is the potential for difficult working conditions during the construction of the restring in the parts that have significant areas of 1% AEP fluvial flood risk or significant 0.5% AEP pluvial flood risk and are crossed by the existing line, particularly towards the Shankbridge area.

If the new Terrygowan substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to one WFD River, River Main (Randalstown), which is of Moderate WFD ecological status, and to four river segments that intersect the area. However, the risk of these impacts can be minimised if there is a sufficient buffer zone between the new substation and these sections of river, and by maintaining good working practices in the construction of the new substation. There is the potential for difficult working conditions and / or flooding of the new substation associated with areas of 0.5% AEP pluvial flood risk located between the Carncome Road and Doagh; development of the new substation in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts. There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new substation.

Air

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

If the new Terrygowan substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

There is potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works associated with uprating of the Kells - Terrygowan 110 kV double circuit OHL, from the use of construction equipment during these works.

There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure. If the new transmission line and new substation are developed within the lower sensitivity areas there is the potential for medium- and long-term, slight reductions in national air emissions and improvement to air quality, owing to the increased renewable energy connection.

Climatic Factors

If the new transmission line is developed within 1% of the best environmental line and the new substation is developed within the 50% lower sensitivity area within the study area, there are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development, as the land us is predominantly agricultural (improved grassland).

There is the potential for difficult working conditions during the construction of the new transmission line from Terrygowan to Rasharkin, where there are several small areas of significant 1% AEP climate change fluvial flood risk, and significant 0.5% AEP climate change pluvial flood risk that are intersected by the area comprising 1% of the best environmental line, particularly towards Rasharkin, Portglenone and Ahoghill. Development of the new infrastructure in these areas should be avoided to minimize the risk of these impacts.

There is the potential for difficult working conditions during the construction of the restring in the parts that have significant areas of 1% AEP climate change fluvial flood risk or significant 0.5% AEP climate change pluvial flood risk and are crossed by the existing line, particularly towards the Shankbridge area.

There is the potential for difficult working conditions and / or flooding of the new substation associated with areas of 0.5% AEP climate change pluvial flood risk located between the Carncome Road and

Doagh; development of the new substation in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts.

There is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new transmission line and substation. However, operation of the new line and substation has the potential for medium- and long-term, slight reductions in national GHG emissions owing to the increased renewable energy connection.

Material Assets & Infrastructure

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line, there is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to several road network areas, including four sections of A road, nine sections of B road, 39 sections of minor road, and ten sections of <4 m tarred road within the study area. The NW gas transmission pipeline crosses through the area that is within 1% of the best environmental line in one location. The presence of this existing infrastructure has the potential for short-term, temporary planning constraints relating to the development of the new line. There is one existing 110 kV OHL within 1% of the best environmental line. Development of the new transmission line within close proximity to this existing infrastructure has the potential for short-term, temporary construction constraints, and should be avoided. If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct disturbance impacts, such as loss of crops, to agricultural land (primarily comprising improved grassland, with small areas of semi-natural grassland and arable land) within the study area which are crossed by the 1% corridor. There are unlikely to be any further medium- or long-term impacts to existing infrastructure within the study area, following the construction of the new line, if it is developed within 1% of the best environmental line.

The uprate of the Kells - Terrygowan 110 kV double circuit OHL has the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to several road network areas, including four sections of dual carriageway, nine sections of B road, 20 sections of minor road, eight sections of <4 m tarred road within the study area that are in proximity to the existing OHL, as well as to one railway line that crosses the existing line. There are two existing 110 kV OHLs and two 275 kV OHLS crossed by the existing Kells - Terrygowan 110 kV OHL; there is the potential short-term, temporary difficulties during construction in the areas in which these lines are crossed by the 110 kV line that is to uprated. There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land that are crossed by the existing 110 kV line, during the restring. There is unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

If the new Terrygowan substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to on section of B road within the study area. There are four existing 110 kV OHLs that intersect the 50% lower sensitivity area; development of the new substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints. If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (predominantly improved grassland). If the new substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for moderate scale development of new electricity infrastructure within the study area, providing an increased supply of secure and reliable renewable energy, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line there are a number of designated heritage features comprising: 29 SMRs, seven Scheduled Zones (raths, standing stone), two Listed Buildings (Carnearney Road and Ballybolan House) and five Industrial Heritage records (flax mill, mill ponds and millrace). If the new transmission

line is developed within close proximity to these sites there is the potential for direct impacts and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new line, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new transmission line.

There is the potential for short-term, temporary, indirect, construction phase disturbance to 12 SMR sites, one Scheduled Zone (standing stone), one Listed Building (Drammaul Old Graveyard), and five Industrial Heritage record sites, during the restring, which are all crossed by or in close proximity to the existing Kells - Terrygowan 110 kV line. There are unlikely be any medium- or long-term impacts on, or the setting of, any known heritage features within the study area, following the restring.

There are unlikely to be any significant short-, medium- or long-term impacts on any known heritage features, or their setting, within the study area, in the development and operation of the new Terrygowan substation, as there are no known heritage features that intersect the 50% lower sensitivity area.

Landscape & Visual Amenity

If the new 110 kV transmission line from Terrygowan to Rasharkin is developed within 1% of the best environmental line, there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects within the Long Mountain Ridge LCA, which is an area of Medium / Low sensitivity to development.

The uprate area intersects five LCAs: Ballymena Farmland, Long Mountain Ridge, River Main Valley, Tardree and Six Mile Water Slopes, and Tardree Upland Pastures. There is the potential for short term, temporary, construction phase, negative landscape and visual effects to the LCAs. Tardree and Six Mile Water Slopes, Ballymena Farmland, and River Main Valley are particularly at risk for impacts during the development of the 110 kV restring, as the existing line crosses the High, or High / Medium sensitivity to development LCAs. There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the 110 kV restring, as the line currently exists, giving no change to the landscape and visual setting.

If the new Terrygowan substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects within the Long Mountain Ridge LCA, which is an area of Medium / Low sensitivity to development.

Additional Impacts

Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F15. Northwest 110 kV Reinforcement – Project 15

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

If the new transmission line is developed within 1% of the best environmental line, there is the potential for short-term, temporary, construction phase, direct disturbance and indirect sedimentation impacts to six Salmonid Rivers and associated species that intersect this area, Aghadowey River Lower, Agivey River Lower, Cam Burn, Culmore River, Mayoghill, and the River Bann (Lower Mid

Reach). However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new transmission line and these sections of river, where possible, and by maintaining good working practices in the construction of the new transmission line in proximity to water bodies.

If the new transmission line is developed within 1% of the best environmental line, there is the potential for short-term, temporary, construction phase, direct (e.g., habitat loss or damage, species disturbance) and indirect impacts (e.g., sedimentation and pollution) to one SLNCI that intersects this area, Culnaman.

There is the potential for short-term, temporary, direct negative impacts on non-designated, semi-natural habitats, within the study area, during the construction of the new transmission line.

Construction of the new transmission line has the slight potential to create a new vector for invasive species or increase the rate of their spread; however, this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for habitat loss impacts on River Faughan & Tributaries SAC, North Channel SAC, Lough Foyle SPA, Lough Foyle Ramsar, Magilligan SAC, Bann Estuary SAC, Skerries & Causeway SAC, North Antrim Coast SAC, Rathlin Island SAC, Red Bay SAC, The Maidens SAC, Rathlin Island SPA, East Coast (NI) Marine SPA, Outer Ards SPA, Sheep Island SPA, River Foyle & Tributaries SAC, Tully Bog SAC, Owenkillew River SAC, Teal Lough SAC, Curran Bog SAC, Ballynahone Bog SAC, Carn-Glenshane Pass SAC, Banagher Glen SAC, Ballynahone Bog Ramsar, Lough Neagh & Lough Beg SPA, Lough Neagh & Lough Beg Ramsar Site, and Outer Ards Ramsar. There is also the potential for water quality and habitat deterioration impacts on River Faughan & Tributaries SAC, North Channel SAC, Lough Foyle SPA, Lough Foyle Ramsar, Bann Estuary SAC, Skerries & Causeway SAC, Rathlin Island SAC, Red Bay SAC, The Maidens SAC, Rathlin Island SPA, East Coast (NI) Marine SPA, Outer Ards SPA, Sheep Island SPA, River Foyle & Tributaries SAC, Tully Bog SAC, Owenkillew River SAC, Teal Lough SAC, Curran Bog SAC, Ballynahone Bog SAC, Carn-Glenshane Pass SAC, Ballynahone Bog Ramsar, Lough Neagh & Lough Beg SPA, Lough Neagh & Lough Beg Ramsar Site, and Outer Ards Ramsar, along with disturbance and displacement impacts on River Faughan & Tributaries SAC, North Channel SAC, Lough Foyle SPA, Lough Foyle Ramsar, Bann Estuary SAC, Skerries & Causeway SAC, The Maidens SAC, Rathlin Island SPA, East Coast (NI) Marine SPA, Outer Ards SPA, Sheep Island SPA, River Foyle & Tributaries SAC, Owenkillew River SAC, Banagher Glen SAC, Ballynahone Bog Ramsar, Lough Neagh & Lough Beg SPA, Lough Neagh & Lough Beg Ramsar Site, and Outer Ards Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

If the new transmission line is developed within 1% of the best environmental line, there is unlikely to be significant direct disturbance impacts to people within any main settlement, as those within the larger study area can be avoided by this area.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the new line, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is potential for short-term, temporary, indirect disturbance impacts to the population within one socially sensitive area, which is an area of lower perceived health intersected near Aghadowey.

There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of a significant volume of secure and reliable electricity, to meet future needs of the population, following the construction of the new transmission line, from the provision of new transmission infrastructure

Geology, Soils & Land use

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct, construction phase impacts, such as soil compaction or destabilisation, current land use disruption and loss of crops, to several types of land uses which may be crossed by the new line, mainly being agricultural areas (primarily improved grassland and semi-natural grassland), with smaller areas of mountain heath and bog, and woodland (broadleaf and coniferous).

If the new transmission line is developed within 1% of the best environmental line, there is potential for short-term, temporary, direct or indirect impacts, to permanent loss of or damage during the construction phase to one ASSI site of geological heritage, Tully Hill, which intersects the lower cost corridor in the east of the study area and is designated for its glacial landforms, comprising a flat-topped delta with sand and gravel ridges to the south. There is also the potential for direct loss or indirect damage to one Forest Service site, Aghadowey, intersected by the north-west of the lower cost corridor.

There are 10 potentially historically contaminated sites in the area that is within 1% of the best environmental line (e.g., mineral workings, textile works and dye works, railway land), and one PPC site (Blackhill Quarries). Works crossing these sites in the short-term could lead to temporary or permanent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area; therefore, this should be avoided if possible.

There is the potential for difficult working conditions during construction and maintenance works owing to topography within an area of uplands that intersects the western extent of the lower cost corridor, and within eight areas of unstable land comprising peat that intersect parts of the corridor; therefore, these areas should be avoided, if possible.

Water

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks or riparian areas to 52 sections of river, and to two drinking water rivers (Macsoquin River and River Bann) that intersect this area, and the potential for short-term, temporary, direct or indirect, construction phase sedimentation and pollution impacts to seven WFD river water bodies that intersect the area: Aghadowey River, Agivey River (Bovagh), Culmore River, Lower River Bann (Kilrea), Macsoquin River, Mayoghill River, Shinney Water; of these, the Agivey River (Bovagh), Macsoquin River, Mayoghill River, and Shinney Water are of Good WFD ecological status, while the remaining three are of less than Good status. However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new transmission line and these sections of river, where possible, and by maintaining good working practices in the construction of the new transmission line in proximity to water bodies.

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, through the centre of the area and in the east, where there are significant areas of 1% AEP fluvial flood risk associated with rivers, mostly located along the River Bann, as well as including the Milltown, McLaughlin's Corner, Garvagh, Brockagh, Kilrea, Agivey, Ringsend and Finvoy areas. There are also numerous areas with significant 0.5% AEP pluvial flood risk that are intersected by the area comprising 1% of the best environmental line. These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line. Development of the new line in these parts of the lower sensitivity corridor should be avoided, or best practice methods employed, to minimize the risk of these impacts.

Air

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary increases in local air emissions and reduction in local air quality,

in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure. If the new transmission line is developed within the lower sensitivity area there is the potential for medium- and long-term, slight reductions in national air emissions and improvement to air quality, owing to the increased renewable energy connection.

Climatic Factors

There are several areas of GHG sequestering natural cover, comprising mountain heath and bog, and woodland (broadleaf and coniferous) within 1% of the best environmental line in the study area. To minimise the potential for short-, medium- or long-term loss of GHG sequestering natural cover during and following the construction of the new line, development over these areas should be avoided.

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, through the centre of the area and in the east, where there are significant areas of 1% AEP climate change fluvial flood risk associated with rivers, particularly located along the River Bann, as well as areas with significant 0.5% AEP climate change pluvial flood risk that are intersected by the area comprising 1% of the best environmental line. These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line. Development of the new line in these parts of the lower sensitivity corridor should be avoided, or best practice methods employed, to minimize the risk of these impacts. However, climate change flood risk within the study area is not significantly different from the current day scenario risk, which is already scored under the Water section. Furthermore, ensuring that the sections of transmission lines in these flood risk areas are resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

There is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new transmission line. However, operation of the new line has the potential for medium- and long-term, slight reductions in national GHG emissions owing to the increased renewable energy connection.

Material Assets & Infrastructure

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to several road network areas, including seven sections of A road, four sections of B road, 26 sections of minor road, and 4 sections of <4 m tarred road within the study area.

The NW gas transmission pipeline cross through the area that is within 1% if the best environmental line in two locations. The presence of this existing infrastructure has the potential for short term, temporary planning constraints relating to the development of the new line. There is one existing 110 kV OHL within 1% of the best environmental line. Development of the new transmission line within close proximity to this existing infrastructure has the potential for short term, temporary construction constraints, and should be avoided.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct disturbance impacts, such as loss of crops, to several types of agricultural land (primarily improved grassland and semi-natural grassland) within the study area which are crossed by the 1% corridor.

There are unlikely to be any further medium- or long-term impacts to existing infrastructure within the study area, following the construction of the new line, if it is developed within 1% of the best environmental line.

There is the potential for moderate scale development of new electricity infrastructure within the study area, providing an increased supply of secure and reliable renewable energy, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within 1% of the best environmental line there are a number of designated heritage features comprising: one listed Park and Gardens of Moore Lodge (intersected in the east of the corridor), 20 Industrial Heritage features (e.g., Bleach Mills, bridges, mileposts, mill buildings), 9 listed buildings, two Scheduled Zones (Plantation castle and village site, and Raised Rath) and 13 SMR sites. If the new transmission line is developed within close proximity to these sites there is the potential for direct impacts and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new line, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new transmission line.

Landscape & Visual Amenity

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to five LCAs that are within the study area, of which the Lower Bann Floodplain LCA and Lower Bann Valley LCA are of High sensitivity, and Binevenagh LCA, Eastern Binevenagh Slopes LCA, and Garvagh Farmland LCA are of Medium sensitivity to development.

There is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to the Binevenagh AONB, if the new transmission line intersects this area in the very west of the 1% best environmental area. This could be minimised by locating the new line further to the east within the study area, not directly intersecting the AONB.

Additional Impacts

Following the development of the new transmission line, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new transmission line take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new transmission line.

F16. Omagh – Dromore Uprating – Project 16

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is the potential for short-term, temporary, direct or indirect sedimentation or pollution impacts to two Salmonid Rivers, Drumragh River and Owenreagh River, which are intersected by the existing Omagh – Dromore OHL, during the restring, and for short-term, indirect downstream sedimentation or pollution impacts to other hydrologically associated Salmonid Rivers within the study area.

There are not expected to be any potential for impacts to Cranny Bogs SAC and ASSI within the study area, as these are situated c. 1.5 km from the existing Omagh – Dromore OHL with no identified connectivity.

There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area in the development of the restring.

There is the potential for short-term, temporary, direct impacts on non-designated, semi-natural habitats, such as temporary habitat loss or damage, and short-term, temporary, disturbance of species in the vicinity of the existing OHL.

Construction of this restring has the slight potential to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on River Foyle and Tributaries SAC, Lough Foyle SPA, and Lough Foyle Ramsar Site. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is the potential for short term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the population within the southern extent of Omagh, which is intersected by the existing Omagh – Dromore OHL, including to the population within areas of lower perceived heath in Omagh.

There is the potential for short-term, temporary, indirect, construction phase disturbance impacts, such as noise and dust, to the local population that are within close proximity to the existing line in a relatively low population density area, during the restring.

There are unlikely to be any further medium- or long-term negative impacts to local populations following the development of the OHL restring.

Geology, Soils & Land use

There is the potential for short-term, temporary, direct impacts to several types of land uses within the study area that are crossed by the existing line during the restring works, mainly being agricultural land (improved grassland and semi-natural grassland with small areas of arable land), as well as small areas of broadleaf woodland and built-up areas at the outskirts of Omagh.

There is the potential for short-term, temporary, interactions with areas of potentially hazardous soils and activities within the study area during the restring, being indirect interactions with three historic land use sites that have the potential to be contaminated (railway lands) and one PPC site (Omagh Meats) that are in proximity (within 500 m) to the existing OHL.

There is the potential for short-term, temporary, indirect interactions with three areas of unstable ground comprised of peat, during the uprate, as the existing line is in close proximity to these areas; this may cause technical difficulties in development.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, in the development of this uprate.

Water

There is the potential for short-term, temporary, direct or indirect impacts, including sedimentation, pollution and damage to river banks, to 37 sections of river within the study area, which are crossed by or in close proximity to the existing line, during the construction phase of the Omagh – Dromore OHL restring. Construction of the restring has the potential for short-term, temporary, direct sedimentation and pollution impacts to two WFD river water bodies within the study area that are intersected by the existing OHL, Drumragh River, and Ballynahatty (Drumragh River), both of which are of Moderate WFD ecological status. However, these risks could be avoided by maintaining good working practices during the restring.

There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP fluvial flood risk associated with rivers that cross the existing line, particularly in the centre and south of this area. There is the potential for difficult working conditions during the construction of the restring where there are scattered areas of significant 0.5% AEP pluvial flood risk that are crossed by, or in proximity to, the existing line.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial, or fluvial flood risk areas within the study area, following the restring of the Omagh – Dromore OHL.

Air

There is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, within non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the restring of the Omagh – Dromore OHL.

There are unlikely to be any further medium- or long-term negative impacts on local air emissions and reductions in local air quality within the study area following the restring. There is the potential for medium- and long-term, slight reductions in national air emissions and improvement to air quality, owing to the increased renewable energy connection.

Climatic Factors

There are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development as uprates are unintrusive and generally only involve agricultural type equipment moving across land.

There is the potential for difficult working conditions during the construction of the restring where there are areas of significant 1% AEP climate change fluvial flood risk associated with rivers that cross the existing line, particularly in the centre and south of this area. There is the potential for difficult working conditions during the construction of the restring where there are scattered areas of significant 0.5% AEP climate change pluvial flood risk that are crossed by, or in proximity to, the existing line. However, climate change fluvial and pluvial flood risk within this area is not significantly different from the current day scenario risk which is already scored under the Water section. Furthermore, ensuring that the OHL infrastructure in these flood risk areas is resilient to flooding will minimise the impacts of potential future flood events on transmission infrastructure within the study area.

There is the potential for short-term, temporary increases in local GHG emissions, in areas which are crossed by or in close proximity to the existing line, from the use of construction equipment during the restring. There is unlikely to be any further medium- or long-term increases in local GHG emissions within the study area following the uprating works. However, operation of the uprated line has the potential for medium- and long-term, slight reductions in national GHG emissions owing to the increased renewable energy connection.

Material Assets & Infrastructure

There is the potential for short-term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to four sections of A road, three sections of B road, 17 sections of minor road, and 18 sections of <4 m tarred roads, that intersect the existing Omagh – Dromore OHL or are in close proximity, during the restring. There are ten existing 110 kV OHLs that intersect or are in proximity to the existing line; there is the potential for short-term, temporary, difficulties during construction in the areas in which this infrastructure is crossed by the Omagh – Dromore OHL that is to be uprated.

There is the potential for short-term, temporary, direct, disturbance to areas of agricultural land (primarily improved grassland, with smaller areas of semi-natural grassland and arable land) that are crossed by the existing Omagh – Dromore OHL, during the restring. There are unlikely to be any further medium- or long-term impacts to material assets or infrastructure within the study area, following the restring.

There is the potential for the development of reinforced electricity infrastructure within the study area, following the restring of the existing circuit, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There is the potential for short-term, temporary, indirect, construction phase disturbance to eight SMR sites (e.g., raths, enclosures, standing stones), one Scheduled Zone (a rath), eight Industrial

Heritage sites (bridges, corn kilns and mileposts) and six listed buildings, which are all crossed by or in close proximity to the existing line Omagh – Dromore OHL, during the restring.

There are unlikely be any medium- or long-term impacts on any known heritage features, or their setting, within the study area, following the restring.

Landscape & Visual Amenity

There is the potential for short-term, temporary, construction phase, negative landscape and visual effects within the Omagh Farmland LCA, which is intersected by the existing Omagh - Dromore OHL, and is of Medium / High sensitivity to development. There are unlikely to be any further medium- or long-term impacts on Landscape and Visual Amenity in the study area, from the restring, as the line currently exists, giving no change to the landscape and visual setting.

Additional Impacts

Following the restring there is the potential for improved reliability and capability of the electricity supply, into the future, within the study area and to the national grid. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally if construction activities associated with the restring take place at the same time as other developments in a specific location. However, at this stage no other significant construction projects are known of within the study area.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the restring.

F17. Mid Tyrone Upgrade – Project 17

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is the potential for short-term indirect (e.g., sedimentation, pollution or disturbance) impacts on one SAC (Cranny Bogs), one ASSI (Cranny Bogs), and six SLNCIs (Mullaghdrolly, Plaister Quarry, Carrick Lough, Crans Lough, Mullycar Lough, and Friary lough), that are in proximity to the lower sensitivity corridor.

If the new transmission line is developed within 1% of the best environmental line, there is the potential for short-term, temporary, construction phase, direct disturbance and indirect sedimentation impacts to ten Salmonid Rivers and associated species that intersect this area, Ballygawley Water, Eskragh Water Lower, Eskragh Water Upper, Killymaddy Tributary (Oona Water), Oona Water Lower, Oona Water Middle, Oona Water Upper, Quiggery Water Middle, River Blackwater Fdr (Ballygreenan), and Routing / Garvaghy Burn Lower. However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new transmission line and these sections of river, where possible, and by maintaining good working practices in the construction of the new transmission line in proximity to water bodies.

There is the potential for short-term, temporary, direct negative impacts on non-designated, semi-natural habitats, within the study area, during the construction of the new transmission line.

Construction of the new transmission line has the slight potential to create a new vector for invasive species or increase the rate of their spread; however, this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project has the potential for water quality and habitat deterioration impacts on Lough Neagh and Lough Beg SPA and Lough Neagh and Lough Beg Ramsar. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

If the new transmission line is developed within 1% of the best environmental line, there is the potential for short-term, temporary, direct disturbance impacts, such as noise and dust, to the population within four settlements that are intersected by this area, Killyman, Eglish (Dungannon LGD), Dungannon, and The Bush, and within a socially sensitive area (area of lower perceived health) in Dungannon. There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the new line, during the construction phase.

There is the potential for medium- to long-term negative impacts to populations in socially sensitive areas due to cumulative effects, following the construction works.

There is the potential for short-, medium- and long-term, temporary, and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium- and long-term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of a significant volume of secure and reliable electricity, to meet future needs of the population, following the construction of the new transmission line, from the provision of new transmission infrastructure.

Geology, Soils & Land use

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct, construction phase impacts, such as soil compaction or destabilisation, current land use disruption and loss of crops, to several types of land uses which may be crossed by the new line, mainly being agricultural areas (primarily improved grassland and with some semi-natural grassland and arable land), with small areas of and woodland (broadleaf and coniferous).

If the new transmission line is developed within 1% of the best environmental line there is also the potential for direct loss or indirect damage within ten Forest Service lands that are intersected within the following forests: Caledon, Parkanaur, Dunmoyle, and Knockmany, and within 55 ancient woodland sites (of which 20 have been lost).

There are 108 potentially historically contaminated sites in the area that is within 1% of the best environmental line (e.g., sewage works and sewage farms, mineral workings, textile works and dye works, railway land), as well as 12 PPC sites and five quarries. Works crossing these sites in the short-term could lead to temporary or permanent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area; therefore, this should be avoided if possible.

There is the potential for difficult working conditions during construction and maintenance works owing to topography within five areas of uplands that intersect the centre of the lower cost corridor, and within 12 areas of unstable land comprising peat that intersect parts of the corridor; therefore, these areas should be avoided, if possible.

Water

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks or riparian areas to 432 sections of river, and to two drinking water rivers (River Blackwater Monaghan, Torrent River) that intersect this area, and the potential for short term, temporary, direct or indirect, construction phase sedimentation and pollution impacts to 18 WFD river water bodies that intersect the area: River Rhone (moygashel), Oona Water (Killymaddy), River Rhone (Dungannon), Ballygawley Water, River Blackwater Tributary (Ballygreenan), Oona Water (Eglish), Torrent River, Tamnamore Stream, River Blackwater Tributary (Aughnacloy), Quiggery Water, Ballynahatty (Drumragh) Water, Cranny Burn, Eskragh Water (Seskinore) Routing Burn, Eskragh Water (Eskragh), River Blackwater (Annaghroe), River Blackwater (Augher), and Lough Neagh Peripherals. Of these, only the River Blackwater Tributary (Ballygreenan) has Good WFD ecological status; the remaining are all of less then Good status, with the majority being Moderate status. There is potential for short-term, temporary, indirect, construction phase sedimentation or

pollution transboundary impacts owing to the connectivity of rivers to the Republic of Ireland. However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new transmission line and these sections of river, where possible, and by maintaining good working practices in the construction of the new transmission line in proximity to water bodies.

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, where there are significant areas of 1% AEP fluvial flood risk associated with rivers, including areas intersected south of Ballygawley and to the south of Seskinore. There are also areas of 0.5% AEP pluvial flood risk intersected throughout the area comprising 1% of the best environmental line, particularly south of Seskinore. These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line. Development of the new line in these parts of the lower sensitivity corridor should be avoided, or best practice methods employed, to minimize the risk of these impacts.

Air

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-term, temporary increases in local air emissions and reduction in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure.

There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure. If the new transmission line is developed within the lower sensitivity area there is the potential for medium- and long-term, slight reductions in national air emissions and improvement to air quality, owing to the increased renewable energy connection.

Climatic Factors

There are several areas of GHG sequestering natural cover, comprising mountain heath and bog, and woodland (broadleaf and coniferous) within 1% of the best environmental line in the study area. To minimise the potential for short-, medium- or long-term loss of GHG sequestering natural cover during and following the construction of the new line, development over these areas should be avoided.

There is the potential for difficult working conditions during the construction of the new line, if it is developed within 1% of the best environmental line, where there are significant areas of 1% AEP climate change fluvial flood risk associated with rivers, including areas intersected south of Ballygawley and around the Eskra area. There are also areas of 0.5% AEP climate change pluvial flood risk intersected throughout the area comprising 1% of the best environmental line. These flood risk areas could become inundated and lead to difficult working conditions during the construction of the new transmission line. Development of the new line in these parts of the lower sensitivity corridor should be avoided, or best practice methods employed, to minimize the risk of these impacts.

There is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new transmission line. However, operation of the new line has the potential for medium- and long-term, slight reductions in national GHG emissions owing to the increased renewable energy connection.

Material Assets & Infrastructure

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct, construction phase disturbances, such as power supply disruptions and increased construction related traffic to several road network areas, including four sections of motorway, four sections of dual carriageway, 50 sections of A road, 52 sections of B road, 82 sections of minor road, and 309 sections of <4 m tarred road within the study area.

The Gas to the West pipeline crosses through the area that is within 1% if the best environmental line. The presence of this existing infrastructure has the potential for short term, temporary planning constraints relating to the development of the new line. There are five existing 110 kV OHLs within 1% of the best environmental line. Development of the new transmission line within close proximity

to these existing infrastructures has the potential for short term, temporary construction constraints, and should be avoided.

If the new transmission line is developed within 1% of the best environmental line there is the potential for short term, temporary, direct disturbance impacts, such as loss of crops, to agricultural land (primarily improved grassland and semi-natural grassland) within the study area which is crossed by the 1% corridor.

There are unlikely to be any further medium- or long-term impacts to existing infrastructure within the study area, following the construction of the new line, if it is developed within 1% of the best environmental line.

There is the potential for moderate scale development of new electricity infrastructure within the study area, providing an increased supply of secure and reliable renewable energy, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within 1% of the best environmental line there are a number of designated heritage features comprising: 160 Industrial Heritage features (e.g., bridges, stations, flax mill and corn mill sites), 32 Listed Buildings, 20 Scheduled Zones (e.g., crannogs, churches, raths, passage tombs), 171 SMR sites (e.g., enclosures, passage tombs, standing stones). There are also one listed Park and Gardens of Martray House and one Area of Archaeological Potential, Carnteel, both of which are intersected by the centre of the 1% corridor. If the new transmission line is developed within close proximity to these sites there is the potential for direct impacts and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new line, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new transmission line.

Landscape & Visual Amenity

If the new transmission line is developed within 1% of the best environmental line there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to six LCAs that are within the study area, of which one is of High sensitivity (Clogher Valley Lowlands LCA), four are of Medium / High sensitivity (Clogher Valley Lowlands LCA, Dungannon Drumlins and Hills LCA, Loughgall Orchard Belt LCA, Omagh Farmland LCA) and one is of Low sensitivity (Slievemore LCA) to development.

Additional Impacts

Following the development of the new transmission line, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new transmission line take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new transmission line.

F18. North Sperrin Generation Substation – Project 18

Discussion of Potential Impacts
Biodiversity, Flora & Fauna

There is the potential for short-term indirect (e.g., sedimentation, pollution or disturbance) impacts on five SACs (Ballynahone Bog, Curran Bog, River Roe and Tributaries, River Faughan and Tributaries, Banagher Glen), one Ramsar site (Ballynahone Bog), two ASSIs (Drumbally Hill, Drumlea and Mullan Woods), two NNRs (Ballynahone Bog and Banagher Glen), and 47 SLNCIs, that are in proximity to, or hydrologically connected to, the 50% lower sensitivity area.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, indirect, construction phase sedimentation or pollution impacts to 37 sections of Salmonid River, that intersect this area. However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new substation and these sections of river, where possible, and by maintaining good working practices in the construction of the new substation in proximity to water bodies.

There is the potential for short-term, indirect sedimentation or pollution impacts to water bodies within the Ballinderry Freshwater Pearl Mussel Catchment, which intersects that south-eastern extent of the 50% lower sensitivity area.

Construction of the new transmission line has the slight potential to create a new vector for invasive species or increase the rate of their spread; however, this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to during construction works.

The HRA of the TDPNI has determined that the development of this project has the potential for habitat loss impacts on Carn-Glenshane pass SAC, River Roe and tributaries SAC, Ballynahone Bog SAC, Ballynahone Bog Ramsar, River Faughan and tributaries SAC, Teal lough SAC, and Curran Bog SAC. There is also the potential for water quality and habitat deterioration impacts on River Roe and tributaries SAC, River Faughan and tributaries SAC, Owenkillew River SAC, and Teal Lough SAC, along with disturbance and displacement impacts on River Roe and tributaries SAC and River Faughan and tributaries SAC. The possibility of likely significant effects cannot be discounted for these European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Population & Human Health

There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, and construction traffic, to the local population that are within close proximity to the substation, during the construction phase. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short-, medium- and long-term, temporary and permanent, increased employment opportunities as a result of construction and maintenance activities relating to the new transmission infrastructure within the study area. There is the potential for medium and long term, permanent, indirect provision of more employment opportunities through impacts upon the supply chain, as a result of increased electricity supply.

There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the development of the substation extension.

Geology, Soils & Land use

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising improved grassland, semi-natural grassland, and mountain heath and bog, but also including smaller areas of broadleaf and coniferous woodland, arable land, and suburban land.

There are 154 areas of ancient woodland, and 15 Forest Service sites intersected by the 50% lower sensitivity area; these areas should be avoided to minimise the potential of short-term, temporary, direct soil compaction and sedimentation impacts during construction, or short- to long-term permanent loss of these woodland areas.

There is the potential for difficulties during construction and maintenance works in the upland areas that parts of the 50% lower sensitivity area, with the exception of the east part of this area; therefore, these areas should be avoided if possible.

There are 445 historical land use areas, six PPC sites, five abandoned mines, and one quarry (located off Quarry Road north of Knockloughrim) that have the potential to be contaminated, and interaction with these sites in the short-term could lead to temporary or permanent impacts on nearby soils and land use. Works crossing these sites has the potential to track contaminated materials further though the study area; however, these sites should be avoidable at the project stage and, should that not be the case, good working practices and planning could minimise the potential for these impacts.

There are unlikely to be any further medium- or long-term impacts to soils, geology or land uses in the study area, following the development of the new substation.

Water

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct or indirect, construction phase sedimentation, pollution or damage to river banks to 1159 sections of river; to 35 WFD Rivers, of which 22 have Good ecological status, the remaining 13 are of less than Good status with the majority (13) being of Moderate ecological status. However, the risk of these impacts can be minimised by ensuring that there is a sufficient buffer zone between the new substation and these sections of river, where possible, and by maintaining good working practices in the construction of the new substation in proximity to water bodies.

There is the potential for difficult working conditions and / or flooding of the new substation associated with areas of significant 1% AEP fluvial flood risk that are intersected by the 50% lower sensitivity area, and areas of significant 0.5% AEP pluvial flood risk throughout the study area, but particularly concentrated in the east of the study area around Maghera, Tobermore, Desermartin, Swatragh and Magherafelt. Development of the new substation in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new / extended substation.

Air

If the new substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, within non-sensitive areas that may be in close proximity to the construction works, from the use of construction equipment during the development of the new substation. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new substation.

If the new substation is developed within the lower sensitivity area there is the potential for medium- and long-term, permanent, slight reductions in national air emissions and improvement to air quality, due to the increased renewable energy connection.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new substation associated with areas of significant 1% AEP climate change fluvial flood risk that are intersected by the 50% lower sensitivity area, and areas of significant 0.5% AEP climate change pluvial flood risk throughout the study area, but particularly concentrated in the east of the study area. Development of the new substation in these areas of the 50% lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area, there is the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new substation is developed within the areas of mountain, heath and bog located through the centre and south-west of the lower sensitivity area, or within areas of coniferous woodland in the centre of the area, or scattered smaller areas of broadleaf woodland. To minimise

the potential of these impacts, development of the new substation within these areas should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation. However, operation of the new substation has the potential for medium- and long-term, slight reductions in national GHG emissions owing to the increased renewable energy connection.

Material Assets & Infrastructure

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to sections of A roads, B roads, minor roads, and < 4 M tarred roads that intersect the study area.

There are eight existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints.

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for slight, short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land, primarily comprising improved grassland, with areas of semi-natural grassland.

If the new / extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for moderate scale development of new electricity infrastructure within the study area, providing an increased supply of secure and reliable renewable energy, with minimal disruption to other assets and infrastructure in the medium and long term.

Cultural, Architectural & Archaeological Heritage

Within the 50% lower sensitivity area of the study area there are there are several known heritage sites, including 378 SMRs, 39 Scheduled Zones (e.g., barrow, raths, court tombs), 173 listed buildings, 529 Industrial Heritage areas (e.g., bridges, gatehouses, tannery, corn mills), and seven Defence Heritage areas.

The 50% lower sensitivity area also intersects nine Areas of Archaeological Potential (Culnady, Curran, Desertmartin, Dungiven, Feeny, Gulladuff, Maghera, Magherafelt and Tobermore), and five parks and gardens (Ampertaine House, Knockan and Ashpark, Learmount, Pellipar,and Rockwood). If the new substation is developed within close proximity to these sites there is the potential for planning constraints as well as direct impacts on these sites and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided.

If there is a sufficient buffer between these heritage sites and the new / extended substation, there are unlikely to be any significant medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new substation.

Landscape & Visual Amenity

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects primarily within nine Landscape Character Areas, Sperrin Foothills LCA, Roe Basin LCA, Garvagh Farmland LCA, Glenshane Slopes LCA, Lower Bann Valley LCA, Moyola Floodplain LCA, Upper Moyola Valley LCA, Slieve Gullion LCA, Magherafelt Farmland LCA; in particular, Glenshane Slopes, Sperrin Foothills, and Lower Bann Valley are of High sensitivity to development.

There is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to the Sperrin AONB, if the new substation is developed in the 50% lower sensitivity area. This could be minimised by locating the new substation within the east or north-east of the study area, as these areas do not directly intersect the AONB.

Additional Impacts

Following the development of the new substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.

F19. Cam Cluster – Project 19

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is the potential for short-term to permanent, direct or indirect impacts on River Roe SLNCI; this site can mostly be avoided by the 50% lower sensitivity area, and potential impacts are likely to be restricted to indirect sedimentation impacts during the construction works.

There is potential for temporary, indirect, sedimentation impacts to the River Roe and Tributaries SAC and ASSI, which is c. 1 km downstream of the 50% lower sensitivity area, during the construction works, due to the presence of a potential pathway via a river water body that transects the area (UKGBNI1NW020202049).

There is potential for direct or indirect, short-term impacts on three salmonid rivers, the Cam Burn, Castle River Tributary and Curly River Upper; however, these rivers are primarily avoided by the 50% least cost area and should be avoided during the project stage.

If the new substation is constructed and operates within the lower sensitivity area, there is the potential for short, medium and long term, permanent loss of non-designated, semi-natural habitats.

Construction of the new transmission line has the slight potential to create a new vector for invasive species or increase the rate of their spread; however, this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to during construction works.

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

Population & Human Health

There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the new substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure

and reliable electricity, to meet future needs of people within the study area, following the cabling construction works, from improvements to existing transmission infrastructure.

Geology, Soils & Land use

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, including coniferous forest, natural grasslands, moors and heathlands, transitional woodland-shrub, and pastures.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of land within six Forest Service areas, five of which are associated with the Cam site and one that is part of the Springwell site.

There is the potential for difficulties during construction and maintenance works in the upland areas that cover most of the 50% lower sensitivity area, with the exception of the east part of this area, along with unstable ground areas comprising peat primarily located in the north of the lower sensitivity area of the study area; therefore, these areas should be avoided if possible.

There are four PPC sites, three of which are located in the centre of the study area and primarily avoided by the 50% lower sensitivity area, and one of which is located in the north-east of the study area and intersected by the lower sensitivity area. There are also 12 historic land use areas that have the potential to be contaminated that intersect the lower sensitivity area (ten are associated with mineral workings, one with ceramics, cement and asphalt manufacturing and one with waste treatment); these are located in the centre, the north-east and the south-east of the area. These sites should be avoided to prevent impacts on nearby soils and land use, as works crossing these sites has the potential to track contaminated materials further though the study area.

Water

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, indirect, construction phase sedimentation and pollution impact to 98 sections of river within the study area. However, the risk of these impacts can be avoided if there is a sufficient buffer zone between the new substation and these sections of river.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to five river WFD water bodies, four of which are at Good WFD status, and one of which (the Aghadowey River) is at Moderate WFD status. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the new substation.

There is potential for short-term, temporary, direct sedimentation and pollution impacts to one drinking water river, the Macosquin River, however this water body is primarily avoided by the lower sensitivity area and the risk of these impacts can be minimised by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions and / or flooding of the new substation in the vicinity of several river segments intersected by the 50% lower sensitivity area, where there are areas of 1% AEP fluvial flood risk and 0.5% AEP pluvial flood risk. Development of the new substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new substation.

Air

If the new substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

If the new substation is developed within the lower sensitivity area there is the potential for medium- and long-term, permanent, slight reductions in national air emissions and improvement to air quality, due to the increased renewable energy connection.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new substation in the vicinity of several river segments intersected by the 50% lower sensitivity area, where there are areas of 1% AEP climate change fluvial flood risk and 0.5% AEP climate change pluvial flood risk. Development of the new substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new substation is developed within the 50% lower sensitivity area within the study area has the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed across the forested areas in the south-east and north-west, or the moors and heathland areas in the east and centre of the study area. To minimise the potential of these impacts, development of the new substation within these areas should be avoided.

If the new substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation. However, construction of the new substation has the potential for medium- and long-term, permanent, slight reductions in national GHG emissions due to the increased renewable energy connection.

Material Assets & Infrastructure

If the new substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to one section of A road, situated in the north-west of the area, sections of B road running across the south of the area, and several sections of minor road within the study area.

There are two existing 110 kV OHLs that intersect the 50% lower sensitivity area; development of the new substation within close proximity to these existing transmission lines has the potential for short term, temporary construction constraints. The North-West Gas Pipeline intersects the 50% lower sensitivity area, in the south of the study area. The presence of this existing infrastructure has the potential for short term, temporary planning constraints relating to the development of the new substation if it is constructed in this area.

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, agricultural pasture land within the east and south-east the study area.

If the new substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area. There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within the 50% lower sensitivity area of the study area there are eight SMR sites, one Scheduled Zone, nine Industrial Heritage areas and one listed building. If the new substation is developed within close proximity to these sites there is the potential for direct impacts on these sites and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new substation, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new substation.

Landscape & Visual Amenity

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to two Landscape

Character Areas, Binevenagh LCA and Eastern Binevenagh Slopes LCA, both of which are High-Medium Sensitive to Development.

There is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to the Binevenagh AONB, if the new substation is developed in the 50% lower sensitivity area. This could be minimised by locating the new substation within the south or east of the study area, as these areas do not directly intersect the AONB.

Additional Impacts

Following the development of the new substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.

F20. Castlereagh 275 kV Redevelopment – Project 20

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

There is the potential for short-term to permanent, direct or indirect impacts on Hillfoot Glen SLNCI, however, this site only intersects a very small part of the 50% lower sensitivity area in the north of the study area and should be avoidable; potential impacts are likely to be restricted to indirect sedimentation impacts during the construction works.

If the new substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short, medium and long term, permanent loss of non-designated, semi-natural habitats.

Construction and operation of the substation is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

Population & Human Health

There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, and construction traffic, to the local population that are within close proximity to the substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure

and reliable electricity, to meet future needs of the population, following the substation redevelopment.

Geology, Soils & Land use

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising improved grassland, but also including small areas of broadleaf woodland, arable land, semi-natural grassland and mountain heath and bog.

There is the potential for short-, medium- and long-term, permanent, direct loss of one area of ancient woodland (Castlereagh) that intersects the north of the 50% lower sensitivity area; therefore, this area should be avoided, if possible.

There is the potential for difficulties during construction and maintenance works in the upland area that intersects the very south part of the 50% lower sensitivity area; this area should be avoided if possible.

Water

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, indirect, construction phase sedimentation and pollution impact to one section of river within the study area (UKGBNI0511604). However, the risk of these impacts can be avoided if there is a sufficient buffer zone between the new substation and these sections of river.

If the new /extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to one river WFD water bodies, the Connswater River, which is of Poor ecological potential WFD status. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions and / or flooding of the new substation in the vicinity of one river segment intersected by the north of the 50% lower sensitivity area, where there are areas of 1% AEP fluvial flood risk, and 0.5% AEP pluvial flood risk, and additional areas of 0.5% AEP pluvial flood risk within areas of hard standing in the centre and west of the 50% lower sensitivity area. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new / extended substation.

Air

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new substation in the vicinity of one river segment intersected by the north of the 50% lower sensitivity area, where there are areas of 1% AEP climate change fluvial flood risk, and 0.5% climate change AEP pluvial flood risk, and additional areas of 0.5% climate change AEP pluvial flood risk within areas of hard standing in the centre and west of the 50% lower sensitivity area. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area has the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed across the areas of broadleaf forest

in the north-east or west. To minimise the potential of these impacts, development of the new / extended substation within these areas should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Material Assets & Infrastructure

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to several sections of minor road in the north and east of the study area and one section of <4M tarred road in the east of the study area.

There are 24 existing 110 kV OHLs, and four existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new / extended substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints.

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, agricultural pasture lands and cultivated lands.

If the new / extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within the 50% lower sensitivity area of the study area there are two Listed Buildings (Charleville, and Leathem House), one Industrial Heritage area (windmill) and two Defence Heritage areas. If the new / extended substation is developed within close proximity to these sites there is the potential for direct impacts on these sites and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new / extended substation, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new / extended substation.

Landscape & Visual Amenity

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to two Landscape Character Areas, Castlereagh Slopes LCA and Castlereagh Plateau LCA, which are of High sensitivity and Medium sensitivity to development, respectively.

Additional Impacts

Following the development of the new substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.

F21. Coolkeeragh 275 kV Redevelopment – Project 21

Discussion of Potential Impacts
Biodiversity, Flora & Fauna There is the potential for short-term, temporary, indirect, sedimentation impacts to Lough Foyle SPA, ASSI, and Ramsar Site, which are immediately adjacent to the east of the study area and 50% lower sensitivity area, during the construction phase of the new / extended substation. There is potential for short-term, temporary disturbance of the designated bird species of these sites during the construction stage; species for which the SPA is designated include wintering Whooper Swan, Light-bellied Brent Goose and Bar-tailed Godwit, as well as nationally-important migratory waterfowl such as Red-throated Diver, Great Crested Grebe, Mute Swan, Bewick's Swan, Greylag Geese, Shelduck, Teal, Mallard, Wigeon, Eider, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Curlew, Redshank and Greenshank. There are unlikely to be any further medium- or long-term negative impacts to International, National or locally protected areas and species within the study area following the laying of these new lines. There is slight potential for the construction works to increase the rate of spread of invasive species, however this can be avoided if strict management protocols, including cleaning of equipment and machinery, are adhered to in construction works. The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.
Population & Human Health There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area. There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works. There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the substation redevelopment.
Geology, Soils & Land use If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising urban land, but also including areas of broadleaf woodland, arable land, and semi-natural grassland. There is one PPC site, Du Pont Maydown, located in the south of the 50% lower sensitivity area, and nine historical land use areas that have the potential to be contaminated (e.g., chemical works, mineral workings and waste recycling) in the north and east of the lower sensitivity area. These sites should be avoided to prevent impacts on nearby soils and land use, as works crossing these sites has the potential to track contaminated materials further though the study area.
Water If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, indirect, construction phase sedimentation and pollution impact to the Foyle Harbour and Faughan WFD transitional water body (currently of Moderate ecological potential WFD status), which intersects the north, and is also adjacent to the east of the study area.

However, the risk of these impacts can be avoided if there is a sufficient buffer zone between the new substation and these areas.

There is the potential for difficult working conditions and / or flooding of the new substation in the north-east of the lower sensitivity area, and adjacent to the north-west of this area, where there are significant areas of 1% AEP fluvial flood risk on the shore of Lough Foyle; in the north of the lower sensitivity area, where there is a significant area of 0.5% AEP coastal flood risk within the vicinity of the Lough Foyle shoreline; and within several areas of 0.5% AEP pluvial flood risk (to the north and south of Electra Road, located on much of the existing infrastructure). Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new / extended substation.

Air

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new substation in the north-east of the lower sensitivity area, and adjacent to the north-west and east of this area, where there are significant areas of 1% AEP climate change fluvial flood risk on the shore of Lough Foyle; in the north of the lower sensitivity area, where there is a significant area of 0.5% AEP climate change coastal flood risk within the vicinity of the Lough Foyle shoreline; and within several areas of 0.5% AEP climate change pluvial flood risk (to the north and south of Electra Road, located on much of the existing infrastructure). Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area there is the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the areas of broadleaf woodland in the south and north-east of the study area. To minimise the potential of these impacts, development of the new / extended substation within these areas should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Material Assets & Infrastructure

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to two sections of minor road and one section of <4M tarred road, running north-east to south-east and south-west to east within the study area, and to a section of railway line that intersects the north part of the lower sensitivity area.

If the new /extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct, construction phase impacts to one gas transmission line (NW Pipeline) that crosses the south-west of the study area. There are 14 existing 110 kV OHLs, and five existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new / extended substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints.

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of

arable land / semi-natural grassland in the south-west; however, the centre of the lower sensitivity area is primarily industrial / commercial land.

If the new / extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within the 50% lower sensitivity area of the study area there are two Defence Heritage areas and one Industrial Heritage area (railway station). If the new / extended substation is developed within close proximity to these sites there is the potential for direct impacts on these sites and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new / extended substation, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new / extended substation.

Landscape & Visual Amenity

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to one Landscape Character Area, Lough Foyle Alluvial Plain LCA, which is of Medium sensitivity to development.

Additional Impacts

Following the development of the new substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.

F22. Kells 275 kV Redevelopment – Project 22

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

If the new / extended substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short-, medium- and long-term, permanent loss of non-designated, semi-natural habitats.

Construction and operation of the substation is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

Population & Human Health

There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the substation redevelopment.

Geology, Soils & Land use

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium-, and long-term, permanent, direct loss of several types of land use, primarily comprising improved grassland, but also including small areas of broadleaf woodland to the north and south of the existing substation in the centre of the lower sensitivity area, and small areas of mountain heath and bog.

There is the potential for difficulties during construction and maintenance works in the upland area that intersects the east part of the 50% lower sensitivity area; this area should be avoided if possible.

There is one historical land use area that has the potential to be contaminated, Kells Substation (power station) in the centre of the lower sensitivity area. This site should be avoided, or care should be taken during access, to prevent impacts on nearby soils and land use, as works crossing this site have the potential to track contaminated materials further though the study area.

Water

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, indirect, construction phase sedimentation and pollution impacts to nine sections of river within the study area, associated with two river water bodies, which run through the centre, the South and the north-west of the area. However, the risk of these impacts can be avoided if there is a sufficient buffer zone between the new substation and these sections of river.

If the new /extended substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct sedimentation and pollution impacts to two river WFD water bodies, the Kells Water (Kells) and Connor Burn, which are both of Moderate ecological WFD status. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions and / or flooding of the new / extended substation associated with the river segments, to the west of Maxwells Road and located at the existing substation between Maxwells Road and Doagh Road, where there are several areas of 1% AEP fluvial flood risk and several areas with 0.5% AEP pluvial flood risk. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new / extended substation.

Air

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There

are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new / extended substation associated with the river segments, to the west of Maxwells Road and located at the existing substation between Maxwells Road and Doagh Road, where there are several areas of 1% AEP climate change fluvial flood risk and several areas with 0.5% AEP climate change pluvial flood risk. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area, there is the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the areas of broadleaf woodland to the north and south of the existing substation in the centre of the lower sensitivity area. To minimise the potential of these impacts, development of the new / extended substation within these areas should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Material Assets & Infrastructure

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to sections of B class road running south-east to north-west and along the south of the lower sensitivity area, and to sections of minor road running south-west to north-east of the area.

There are eight existing 110 kV OHLs, and eight existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new / extended substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints.

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (improved grassland).

If the new / extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There are unlikely to be any significant short-, medium- or long-term impacts on any known heritage features, or their setting, within the study area, in the development and operation of the new / extended substation, as there are no known heritage features in close proximity to the existing substation.

Landscape & Visual Amenity

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to two Landscape Character Areas, Tardree and Six Mile Water Slopes LCA and Tardree Upland Pastures LCA, which are of High and Low / Medium sensitivity to development, respectively.

Additional Impacts

Following the development of the new substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.

F23. Magherafelt 275 kV Redevelopment – Project 23

Discussion of Potential Impacts
Biodiversity, Flora & Fauna There is the potential for short-term, temporary, indirect, sedimentation impacts to a Salmonid River, Magherafelt Burn, which runs through the centre and north of the study area and 50% lower sensitivity area, during the construction phase of the new / extended substation. If the new / extended substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short-, medium- and long-term, permanent loss of non-designated, semi-natural habitats. Construction and operation of the substation is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction. The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.
Population & Human Health There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area. There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works. There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the substation redevelopment.
Geology, Soils & Land use If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising improved grassland, but also including areas of semi-natural grassland and arable land, and an area of broadleaf woodland in the north of the lower sensitivity area. There is one historical land use area that has the potential to be contaminated, a former ceramics, cement and asphalt manufacturing facility located in the centre of the lower sensitivity area. This site

should be avoided to prevent impacts on nearby soils and land use, as works crossing this site have the potential to track contaminated materials further though the study area.

Water

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, indirect, construction phase sedimentation and pollution impact to six sections of river within the study area, which run through the centre from west to south, and from the centre to the south of the area. However, the risk of these impacts can be avoided if there is a sufficient buffer zone between the new / extended substation and these sections of river.

If the new /extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to one WFD River, Magherafelt Burn, which is of Moderate ecological potential. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions and / or flooding of the new / extended substation associated with areas of significant 1% AEP fluvial flood risk, including land to the north of the existing substation along Ballymoghan Drain to the north-east and an unnamed drain to the north-west, as well as to the east and south of the existing substation along Gortagilly Drain; and with areas of significant 0.5% AEP pluvial flood risk, including along an unnamed drain to the west of the existing substation, along Ballymoghan Drain to the north-east of the existing substation, the Gortagilly Drain to the east and south of the existing substation, and along the Thompsons Hill Drain to the east of the existing substation. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new / extended substation.

Air

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, in non-sensitive areas that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new / extended substation associated with areas of significant 1% AEP climate change fluvial flood risk, including land to the north of the existing substation along Ballymoghan Drain to the north-east and an unnamed drain to the north-west, as well as to the east and south of the existing substation along Gortagilly Drain; and with areas of significant 0.5% AEP climate change pluvial flood risk, including along an unnamed drain to the west of the existing substation, along Ballymoghan Drain to the north-east of the existing substation, the Gortagilly Drain to the east and south of the existing substation, and along the Thompsons Hill Drain to the east of the existing substation. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area, there is the potential for short-, medium- and long-term, permanent loss of GHG sequestering vegetation, if the new transmission infrastructure is developed within the area of broadleaf woodland in the north of the lower sensitivity area. To minimise the potential of these impacts, development of the new / extended substation within this area should be avoided.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Material Assets & Infrastructure

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to two sections of minor road running from north to east of the study area, and to a section of <4 M tarred road running from the centre to the south of the area.

There are eight existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new / extended substation within close proximity to these existing transmission lines has the potential for short term, temporary construction constraints.

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (mostly improved grassland, with some areas of semi-natural grassland and arable land).

If the new / extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

Within the 50% lower sensitivity area of the study area there is one SMR site (a burial ground) and one Industrial Heritage area (a limeworks). If the new / extended substation is developed within close proximity to these sites there is the potential for direct impacts on these sites and / or indirect impacts on the setting of, these heritage features, and therefore this should be avoided. If there is a sufficient buffer between these heritage sites and the new / extended substation, there are unlikely to be any significant short-, medium- or long-term impacts on, these features or their settings within the study area, in the development and operation of the new / extended substation.

Landscape & Visual Amenity

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to the Magherafelt Farmland LCA, which is of Medium / High sensitivity to development.

Additional Impacts

Following the development of the new substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.

F24. Tandragee 275 kV Redevelopment – Project 24

Discussion of Potential Impacts

Biodiversity, Flora & Fauna

If the new / extended substation is constructed and operates within the 50% lower sensitivity area, there is the potential for short-, medium- and long-term, permanent loss of non-designated, semi-natural habitats.

Construction and operation of the substation is unlikely to create a new vector for invasive species or increase their rate of spread, provided that strict management protocols, including cleaning of equipment and machinery, are adhered to in construction.

The HRA of the TDPNI has determined that the development of this project does not have the potential for impacts on any European Site. The possibility of likely significant effects can be discounted for this project at the screening stage of appropriate assessment.

Population & Human Health

There is unlikely to be significant direct disturbance impacts to people within any main settlement, as there are none within the 50% lower sensitivity area, or the wider study area.

There is the potential for short-term, temporary, indirect disturbance impacts, such as noise and dust, to the local population that are within close proximity to the substation, during the construction phase. However, this would not affect a large number of people owing to the low population density of the area. There is no potential for negative effects on the population of any socially sensitive areas (areas of lower perceived health, peace lines or Neighbourhood Renewal Areas). There are unlikely to be any further medium- or long-term negative impacts to local populations following the construction works.

There is the potential for short- to long-term employment opportunities from the substation development and operation. There is the potential for medium- and long-term provision of secure and reliable electricity, to meet future needs of the population, following the substation redevelopment.

Geology, Soils & Land use

If the new substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct loss of several types of land use, primarily comprising improved grassland, but also including areas of semi-natural grassland and arable land.

There are two historical land use sites intersecting the 50% lower sensitivity area that have the potential to be contaminated, both of which are road vehicle fuelling, service and repair: garages and filling stations. These sites should be avoided to prevent impacts on nearby soils and land use, as works crossing these sites have the potential to track contaminated materials further though the study area.

Water

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, indirect, construction phase sedimentation and pollution impact to four sections of river within the study area, which intersect the south-east and the west of the lower sensitivity area. However, the risk of these impacts can be avoided if there is a sufficient buffer zone between the new / extended substation and these sections of river.

If the new /extended substation is developed within the 50% lower sensitivity area there is the potential for short-term, temporary, direct sedimentation and pollution impacts to two WFD Rivers, the Annagh River and Cusher River (Tandragee), which are of Bad and Moderate WFD status, respectively. However, the risk of these impacts can be minimised by maintaining good working practices in the construction of the new substation.

There is the potential for difficult working conditions and / or flooding of the new / extended substation associated with areas of significant 0.5% AEP pluvial flood risk that intersect the 50% lower sensitivity area, surrounding the Portadown Road, Ballyknock Road, Mullahead Road and the Ballymore Extension Drain. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

There are unlikely to be any further medium- or long-term impacts to water status and resource, or any interactions with coastal, pluvial or fluvial flood risk areas within the study area, following the development of the new / extended substation.

Air

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local air emissions and reductions in local air quality, within a sensitive area (the Armagh City, Banbridge and Craigavon Borough Council AQMA, which covers the entire borough) that will be in close proximity to the construction works, from the use of construction equipment during the development of the new transmission infrastructure. There are unlikely to be any further medium- or long-term increases in local air emissions or reductions in local air quality following the development of the new transmission infrastructure.

Climatic Factors

There is the potential for difficult working conditions and / or flooding of the new / extended substation associated with areas of significant 0.5% AEP climate change pluvial flood risk that intersect the 50% lower sensitivity area, surrounding the Portadown Road, Ballyknock Road, Mullahead Road and the Ballymore Extension Drain. Development of the new / extended substation in these areas of the lower sensitivity area should be avoided to minimize the risk of these impacts.

If the new / extended substation is developed within the 50% lower sensitivity area within the study area, there are unlikely to be any significant short-, medium- or long-term impacts on GHG sequestering vegetation from this development.

If the new / extended substation is developed within the 50% lower sensitivity area of the study area there is the potential for short-term, temporary increases in local GHG emissions, from the use of construction equipment during the construction phase. There are unlikely to be any further medium- or long-term increases in local GHG emissions following the development of the new substation.

Material Assets & Infrastructure

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short term, temporary, direct, construction phase disturbance impacts, such as power supply disruptions and increased construction related traffic, to two sections of A road that intersect parts of the west and south of this area; two sections of B road that intersect parts of the north-east to south-east of this area; two sections of minor road that intersect parts of the south of this area; and one section of <4 m tarred road that intersects parts of the north and centre of this area.

There are three existing 110 kV OHLs, and six existing 275 kV OHLs that intersect the 50% lower sensitivity area; development of the new / extended substation within close proximity to these existing transmission lines has the potential for short-term, temporary construction constraints.

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, direct disturbance to, or loss of, areas of agricultural land (including improved grassland and semi-natural grassland).

If the new / extended substation is developed within the 50% lower sensitivity area there is unlikely to be any further medium- or long-term impacts to existing infrastructure or material assets within the study area.

There is the potential for the moderate scale local development of new electricity grid infrastructure within the study area, with minimal disruption to other assets and infrastructure in the medium- and long-term.

Cultural, Architectural & Archaeological Heritage

There is one Defence Heritage record area located at the existing substation; there are unlikely to be any significant short-, medium- or long-term impacts on this site, as it can be avoided by the 50% lower sensitivity area. There are unlikely to be any significant short-, medium- or long-term impacts on any other known heritage features, or their setting, within the study area, in the development and

operation of the new / extended substation, as there are no other known heritage features in close proximity to the existing substation.

Landscape & Visual Amenity

If the new / extended substation is developed within the 50% lower sensitivity area there is the potential for short-, medium- and long-term, permanent, negative landscape and visual effects to two LCAs that are within the study area, the Upper Bann Floodplain LCA and the Loughgall Orchard Belt LCA; these areas are of High and Medium sensitivity to development, respectively.

Additional Impacts

Following the development of the new substation, there is the potential for improved reliability and capability of the electricity supply, into the future. This reinforcement of electricity infrastructure will have direct secondary, positive impacts on other assets, which in turn has the potential to have positive impacts on people into the future, such as improved job security and more reliable functioning of services such as transport networks and energy supply.

A range of cumulative impacts have the potential to arise locally when construction activities associated with the new substation take place at the same time as other developments in a specific location. However, at this stage it is not known what other developments may take place at the same time.

There are unlikely to be any other additional secondary, cumulative, synergistic, permanent and temporary, positive or negative effects during or following the development of the new substation.