ENVIRONMENTAL STATEMENT
NON TECHNICAL SUMMARY

CURRAGHINALT 33KV CONNECTION PROJECT

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1 INTRODUCTION

1.1 Project Background

This Non-Technical Summary (NTS) forms part of the Environmental Statement (ES) provided in support of two planning applications, submitted by NIE Networks on 22nd November 2019, to Fermanagh and Omagh District Council (planning reference LA10/2019/1386/F) and Derry City and Strabane District Council (planning reference LA11/2019/1000/F) seeking planning permission to provide a 33kV electricity connection to the proposed Curraghinalt mine, currently under consideration by Department for Infrastructure (DfI) under planning application LA10/2017/1249/F. NIE Networks are providing the connection under their statutory and regulatory obligations as set out in the Electricity (Northern Ireland) Order 1992 and NIE Networks' Distribution Licence. For the purposes of this ES the electricity connection (the Proposed Development) is considered and assessed as an integral part of the overall mine project and therefore the environmental effects of the Proposed Development are considered and assessed together with the effects of the mine application.

The DfI *called in* the power line planning applications on 23rd December 2019, under the provision of Section 29 of the Planning Act (Northern Ireland) 2011.

The Proposed Development connects the existing NIE Networks Strabane substation to a proposed substation building at the mine site; the substation at the mine site is proposed as part of planning application LA10/2017/1249/F.

The proposed 33kV connection is c37.9 km in length, comprising of c26.9 km of overhead line (OHL) supported by single and double wooden pole sets and c11 km of underground cabling.

The location of the Proposed Development is presented in Plate 1.1 below:

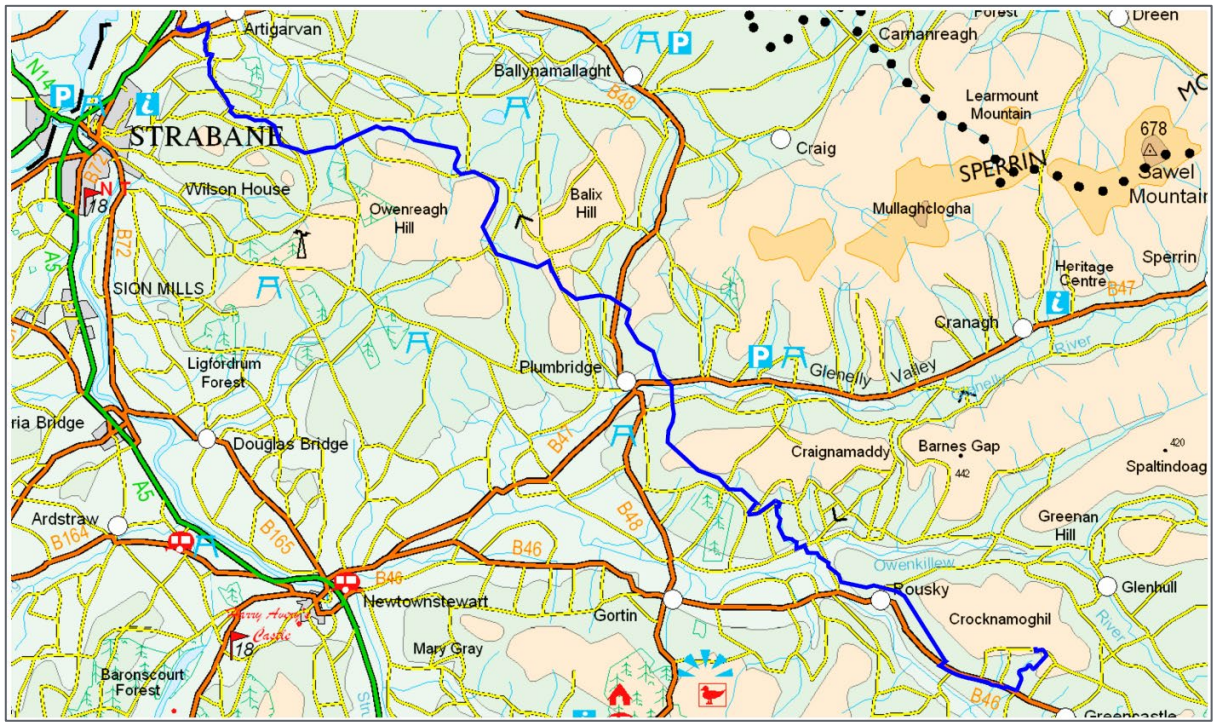

Plate 1.1: Proposed Development Location

The following drawings were submitted in November 2019 in support of the aforementioned planning applications:

- *Drawing number 698-1-30_20191121 - SITE LOCATION*
- *Drawing number 698-1-20-25_20191121 - SITE BOUNDARY & PROPOSED WORKING AREA**
- *Drawing number 698-1-27-32_20191121 - SITE BOUNDARY*
- *Drawing number 81-2017-CP-0092 - INTERMEDIATE SINGLE POLE POSITION*
- *Drawing number 81-2017-CP-0099-A4P - SECTION STRAIGHT THROUGH H-POLE POSITION*

- *Drawing number 81-2017-0131 - INTERMEDIATE H POLE LONG SPAN POSITION*
- *Drawing number 81-2017-CP-0101 PAGE 1 SECTION ANGLE H-POLE POSITION ELEVATION*
- *Drawing number 81-2017-CP-0101 PAGE 2 SECTION ANGLE H-POLE POSITION ELEVATION*
- *Drawing number 81-2017-CP-0106 PAGE 1 TERMINAL H- POLE POLE POSITION ELEVATION*
- *Drawing number 81-2017-CP-0106 PAGE 2 TERMINAL H- POLE POLE POSITION ELEVATION*
- *Drawing number CW33-1D-33kV CIRCUIT SECTION FOR 3X 33KV CABLES IN DUCTS*

** Drawing number 698-1-23* has been updated to illustrate an amendment of the proposed overhead line route and the associated placement of poles 2216 – 2228; this alteration has been made in consideration of a consultation response from the Department for Communities (DfC) Historic Environment Division (HED) which was provided as part of the DfI's Environmental Impact Assessment (EIA) screening exercise and subsequent discussions and a site visit with HED. The change is minor and, apart from providing further mitigation in respect of cultural heritage interests, does not give rise to any other significant environmental effects.

1.2 Context of the Environmental Impact Assessment

1.2.1 Request for EIA Screening Determination

The DfI *called in* the planning applications (LA11/2019/1000/F and LA10/2019/1386/F) on 23rd December 2019 under Section 29 of the Planning Act (Northern Ireland) 2011. Subsequently, a request for an EIA Screening Determination was submitted to the DfI in January 2020, pursuant to Regulations 8 and 12 of The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 (the EIA Regulations).

1.2.2 DfI Screening Determination

The DfI issued its EIA Screening Determination letter on 8th December 2020. Within the body of the letter, the DfI stated as follows:

> *"The Department is of the opinion that the proposed development would be likely to have significant effects on the environment and hereby determines that the planning application must be accompanied by an Environmental Statement."*

1.3 Structure of the Environmental Statement

Information contained in this ES is presented in the following way:

- Non-Technical Summary;
- Volume I Environmental Statement (main reporting text);
- Volume II Drawings and Figures; and
- Volume III Appendices.

Table 1.1 below sets out the chapters contained within Volume I of the ES.

Table 1.1: Volume I Structure

Chapter	Title
1	INTRODUCTION
2	PROJECT DESCRIPTION AND NEED
3	ALTERNATIVES
4	SCOPING AND CONSULTATION
5	LANDSCAPE AND VISUAL

6	CULTURAL HERITAGE
7	TERRESTRIAL ECOLOGY AND ORNITHOLOGY
8	FISHERIES AND AQUATIC ECOLOGY
9	WATER QUALITY
10	FLOOD RISK
11	POPULATION AND HEALTH
12	AIR QUALITY
13	CLIMATE AND GREENHOUSE GASES
14	NOISE AND VIBRATION
15	TRAFFIC
16	WASTE MANAGEMENT
17	MAJOR ACCIDENTS AND DISASTERS
18	INTERACTIONS

1.4 Competency

This ES has been prepared by competent experts in accordance with the requirements of Regulation 11(3)(a) of the EIA Regulations as set out in Chapter 1 of this ES.

1.5 EIA Methodology

Details of the methodology used in each individual discipline are provided in the relevant chapter of Volume I.

Except where inappropriate, each of the chapters of the ES conforms to the following broad format:

- Scoping / consultation exercise: to compile relevant background data and identify issues and constraints arising from the EIA screening exercise;
- Baseline surveys - including walk-over visits, detailed specialist surveys and, where relevant, discussions with relevant statutory and other consultees to determine the nature and extent of the existing environment;
- An assessment of the likely evolution of the host environment without the Proposed Development, based on the likelihood that the evolution of the host environment without the Proposed Development will be characterised by existing windfarm developments anticipated to be in existence for c.25 years, other electrical connections to be of similar lifespan and replaced as necessary, and on the basis of prevailing planning policy that new development will be typically dominated by further single houses in the countryside; relatively modest developments in Strabane and the smaller settlements and limited opportunities for further wind turbine development within the Area of Outstanding Natural Beauty, and on the basis that if the Proposed Development does not take place it is unlikely that the mine project will take place;
- Identification of potential significant effects - predicting the likely significant environmental effects (the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-

term, permanent and temporary, positive and negative effects) of the Proposed Development during the construction and operational phases;

- Interactions and cumulative effects - A description of the likely significant effects of the Proposed Development resulting from, *inter alia*, the cumulation of effects with other existing and/or approved development and interactions between different elements of the overall mine project, including the Proposed Development;
- Mitigation & Monitoring - A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment, the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset and, where appropriate, of any proposed monitoring arrangements for both the construction and operational phases;
- Residual effects - consideration of the residual effects remaining after mitigation;
- Reporting - preparation of the ES, including a Non-Technical Summary (NTS).

1.6 Cumulative Effects and Interactions

The Cumulative Impact Assessment (CIA) considers the likely cumulative impacts arising from the Proposed Development alongside the likely impacts of 'other existing development and/or approved development' in the vicinity of the Proposed Development, based on publicly available information. The assessment also specifically considers the likely cumulative impacts arising due to the interactions between the Proposed Development and the overall mine project together with 'other existing development and/or approved development'.

The Environmental Protection Agency (EPA) (2017) defines cumulative effects as "*the addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects".*

The following guidelines shaped the CIA:

- The EPA Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2017);
- Guidelines on the Assessment of Indirect and Cumulative Impacts as well as Impact interactions (European Commission, 1999);
- Guiding Principles for Cumulative Impact Assessment in Offshore Wind Farms (Renewable UK, 2013);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017); and
- UK Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment (PINS, 2019).

Each chapter in the ES considers potential cumulative impacts in respect of that environmental discipline having regard to the scale and nature of the other development and whether that is likely to interact with the Proposed Development to give rise to a significant cumulative environmental impact. The assessment also considers the temporal scope in respect of the construction and operation of other relevant developments.

The chapters also assess whether the nature and/or capacity of the receiving environment would give rise to a significant cumulative and interactive impact when considered with the Proposed Development.

Each chapter describes any measures required to avoid, prevent or effectively mitigate any identified significant cumulative effects.

1.7 Assessment of Effects

The assessment of whether the Proposed Development is likely to have a significant effect on the environment has been undertaken through a variety of methods:

- Relevant published guidance criteria in conjunction with professional judgement and experience allied to, as may be referenced within assessments;
- Assessment of both temporary and permanent effects (direct, indirect, secondary and residual);
- Assessment of interaction and cumulative effects;
- Assessment of duration and reversibility of these effects;

- Assessment against local, regional and national planning policy; and
- Consultation with statutory and non-statutory consultees.

Table 1.2 (Chapter 1) provides a standardised method of defining sensitivity or value of a receptor. Table 1.3 in Chapter 1 provides a standardised method of defining a magnitude of effect. Significance of effect is determined in each assessment chapter by correlating the magnitude of the impact to the sensitivity of the receptor or resource. Both sensitivity/value and magnitude must be taken into account in determining the significance of effect as detailed in Table 1.4 and 1.5 (Chapter 1).

2 PROJECT DESCRIPTION AND NEED

2.1 Project Description

The Proposed Development is defined as follows, within the planning applications:

"The 33kV power line involves both the construction of above ground 33kV overhead line supported by wooden poles and underground 33kV cable laid below ground level in ducts.

The Proposed Development connects the existing NIE Networks Strabane substation to a proposed substation building at the mine site; the substation at the mine site is proposed as part of planning application LA10/2017/1249/F.

The proposed 33kV connection is c37.9 km in length, comprising of c26.9 km of overhead line supported by single and double wooden pole sets and c11 km of underground cabling.

c22.8 km of the powerline is within the Derry & Strabane District Council area.

c15.1 km of the powerline is within the Fermanagh & Omagh District Council area.

The boundary, where the powerline crosses between council areas between proposed pole 2220 and proposed pole 2221, is clearly marked on the attached planning maps.

The Proposed Development comprises of an underground cable connected from the existing 110/33kV Strabane main substation which extends into an overhead line between Hollyhill and Curlyhill Road from pole 2001. From this point, the overhead line route generally follows a south easterly direction which is undergrounded at various locations, mainly along public roads. The overhead line route terminates at proposed pole 2322 before being undergrounded along Crockanboy Road and connecting into a substation at the Curraghinalt mine."

The overhead line design is a mix of single and double ("H") wood pole structures which are supported by stays at points where the overhead line route changes direction or terminates. Each wooden pole will have a 200mm head diameter. The pole heights will range from 11-20m, with the H pole consisting of 2 poles braced together 1.8m apart and a steel cross arm supporting the 3 phase conductors.

2.2 Overhead Line

2.2.1 Overhead Line Route Description

The Proposed Development comprises of an underground cable connected from the existing 110/33kV Strabane main substation which extends into an overhead line between Hollyhill and Curlyhill Road from pole 2001. From this point, the overhead line route generally follows a south easterly direction which is undergrounded at various locations, mainly along public roads. The overhead line route terminates at pole 2322 before being undergrounded along Crockanboy Road and connecting into a substation at the proposed Curraghinalt Mine.

Route lengths of the various Overhead Sections are as follows:

- Poles 2001-2137: c11.9km
- Poles 2138-2154: c1.5km
- Poles 2155-2201: c3.6km
- Poles 2202-2248: c4.1km
- Poles 2251-2261: c0.8km
- Poles 2262-2322: c5.0km

The detailed route of the Proposed Development including underground cable sections and (numbered) pole locations is shown on drawing numbers 698-1-20 - 698-1-25 Proposed 33kV Powerline Strabane Main to Proposed Curraghinalt Mine Development submitted in support of the planning applications. The working area of the Proposed Development is defined by the red line boundary as shown on the aforementioned drawings.

2.2.2 Overhead Line Specification

The overhead line element of the Proposed Development is c26.9km in length, rated at 33kV and comprising of 3x200 sq.mm All Aluminium Alloy Conductors (AAAC).

2.2.3 Overhead Line Structure Specification

The design is a mix of single and H (double) wood pole structures which are supported by stays at points where the overhead line route changes direction or terminates. Each wooden pole will have a 200mm head diameter. The pole heights will range from 11-20m, with the H pole consisting of 2 poles braced together 1.8m apart and a steel cross arm supporting the 3 phase conductors.

2.2.4 Overhead Line and Structure Access

Access to each pole structure (for the purpose of construction and operational maintenance) will be via public carriageway and/or existing accesses. The largest construction vehicles to be employed on private lands will be agricultural tractors and a 13 or 20 tonne (wide) tracked excavator. All access routes have been surveyed to ensure adequate accessibility for the required construction vehicles and to assess and identify any environmental constraints to ensure accessibility without any likely significant impact.

2.2.5 Overhead Line Operation and Maintenance

Once the circuit is commissioned it will be subject to inspections from the ground every three years. This will involve a single person travelling to a suitable car parking location near the overhead line and then walking along the route to visually inspect the overhead line. Vegetation management will also be carried out periodically as required (when vegetation encroaches on specified safety clearances, NIE Networks vegetation management cycle is once every three years). Wood pole replacement occurs every 30-40 years. These works will have the same impact as, or lesser impact, than that of construction of the overhead line.

2.2.6 Decommissioning of the Overhead Line

Once operational, the overhead line will become a network asset and form part of the wider network. Decommissioning is not envisaged, however should the overhead line be required to be decommissioned, all associated structures and materials would be recovered and items recycled with the site returned to its original use. Decommissioning impacts will be the same or lesser than the impact of construction.

2.3 Underground Cable

2.3.1 Underground Cable Route Description

The c11km of underground cable in the Proposed Development is split across 7 sections of the Proposed Development:

- Underground cable section 1: 3.60km from Strabane Main Substation to terminal pole number 2001 located in field adjacent to Hollyhill Road.
- Underground cable section 2: 0.342km from terminal pole number 2137, located in the field adjacent to Meendamph Road, to terminal pole number 2138, also located in the field adjacent to Meendamph Road.
- Underground cable section 3: 0.063km west of Glencoppagh Road, crossing between terminal poles 2154 and 2155.
- Underground cable section 4: 0.103km crossing underneath the Landahussy Road between terminal poles 2201 and 2202.
- Underground cable section 5: 1.6km from terminal pole 2248 adjacent to Glenforan Road, to terminal pole number 2251, located in lands adjacent to Meenadoo Road.

- Underground cable section 6: 0.993km from terminal pole number 2261, located in agricultural lands accessed from Glenforan Road, to terminal pole number 2262, located in lands adjacent to Gorticashel Road.
- Underground cable section 7: 4.23km from terminal pole number 2322, located in agricultural lands adjacent to Crockanboy Road to the entrance to the proposed Curraghinalt Mine, following along the proposed access road for the proposed Curraghinalt Mine ending at the electrical substation proposed as part of the Curraghinalt Mine development.

The location of underground cable sections is shown on planning drawing numbers 698-1-20 – 698-1-26 Proposed 33kV Powerline Strabane Main to Proposed Curraghinalt Mine Development. The working area of the Proposed Development is defined by the red line boundary as shown on the aforementioned drawings.

2.3.2 Underground Cable Specification

The underground cable is rated at 33kV and comprising of 3x240 mm^2 single core XLPE cables installed in 100mm diameter ducts with an additional 100mm diameter duct also laid as a spare duct for communication links. The cable trench will be no more than 500mm wide by 1000mm deep.

The underground cable section design is shown in planning drawing number CW33-1D 33kV Circuit Section. Provision is made for alternative construction options where required, as identified by completed road and watercourse surveys. These locations are shown in drawing number 698-1-1-4_20191128 Structures and Watercourse Crossings (Sheet 1 – 4).

2.4 Overhead Line Construction Methodology

2.4.1 Overhead Line Construction

The construction concepts associated with the overhead line construction and the sequence of construction for the installation of the overhead line element of the Proposed Development are set out below.

2.4.2 Construction Concepts

***Line Stringing Section*:** A Line Stringing Section typically consists of approximately 15-20 pole structures which are strung with overhead line conductor in one section. A Line Stringing Section could vary in size from as little as 3 poles to as many as 25 poles, however 15-20 poles is typical. The length of the Line Stringing Section is dependent upon such factors as maximum available continuous length of conductor or angle positions in the line.

Active Work Section: Due to the nature of construction of overhead electricity lines, the Proposed Development will be constructed progressively along the proposed route in a sequential fashion, with the Active Work Section progressively moving along the route as the installation is completed. Each Active Work Section will have one Overhead Line Construction Work Team and will consist of a maximum of 50 poles (typically 30-40 poles).

Multiple Active Work Sections may be constructed in parallel where additional work teams are utilised, this will be subject to Landowner engagement and site access.

Active Work Location: Within an Active Work Section, each sub-team will work simultaneously at different Active Work Locations progressing sequentially along the Active Work Section i.e. Team A will start and progress along the line, Team B will follow behind and Team C will follow behind Team B and so on.

The Active Work Location duration for each team will vary due to the nature of their work, with the maximum duration of works at an Active Work Location expected to be:

- 1 day for Tree cutting
- ½ day for Access and Landowner Engagement
- ½ day for Material Delivery
- 1 - 3 days for Pole Erection (typically <1 day)

- 10 days for stringing (typically 5 days)
- ½ days for Audit

Therefore the typical total days of work at each Active Work Location are 8½ days, up to a maximum of 15½ days total work duration.

2.4.2.1 Work Team Awareness and Monitoring and Control

During the initial site induction, all staff will be briefed by the appointed NIE Networks Site Manager and Environmental Officer on the required measures at each site to ensure integrity of existing habitats and species during the construction phase.

A notice board will be erected at each access point which will identify key staff, environmental requirements and relevant contact numbers.

All site visitors will be briefed on the site specific environmental considerations by the appointed NIE Networks Site Manager and Environmental Officer and advised of the required control measures at that particular site.

Prior to work commencing each team will receive a Tool Box Talk (local staff briefing in NIE Networks depot or on site) on the proposed day's activities specific to their work site. The information will include advice from the NIE Environmental Officer and the ECoW. The Tool Box Talk session will be carried out by the appointed Contractor Environmental Manager.

Adherence to any required procedures and site rules will be monitored via regular audits carried out by the NIE Networks Environmental Officer and the ECoW. These audits will occur, at a minimum, every two working days during tree cutting, pole erection and all underground cable construction activities and at least once a week during overhead line stringing activities.

A monthly report will be compiled to outline audits completed and identify remedial actions taken on site to ensure compliance with required procedures. This report will include environmental aspects such as incidents, near misses, waste disposal records and environmental tool box talks.

2.4.3 Overhead Line Construction Sequence and Methodology

The construction of the proposed overhead line will follow the sequence of events as outlined below:

2.4.3.1 Tree Cutting

Tree cutting will be carried out to ensure that vegetation is outside of the clearance distances of the Overhead line in accordance with NIE Networks policy 6/025 Clearance to Overhead Lines (www.nienetworks.co.uk/icp/dashboard). A *clear fell* strip of 10m will be secured for the purposes of construction.

2.4.3.2 Pre-Construction Site Access and Engagement with Third Parties

All site accesses for the construction of the Proposed Development have been surveyed and assessed for the full range of construction equipment required. All site access will be via public roadways and existing accesses with no additional works or modifications to accesses required to accommodate construction works. The construction vehicles that will be used for the construction of the overhead line will not result in any significant impact to the existing road network and agricultural accesses.

Local weather patterns and land conditions will also be monitored prior to site access to ensure any impact is minimised. Movement of vehicles on-site will be suspended during heavy rainfall when ground conditions may be likely to deteriorate and will only recommence when ground conditions are judged by the Contractor Environmental Manager, to be sufficiently recovered.

2.4.3.3 Material, Machinery and Equipment Arrival

All materials will be stored at NIE Networks Omagh depot and will be delivered directly to the Active Work Locations as required for construction. The Material Delivery Team will deliver the poles and associated steelwork to as far as the access will allow for the pole delivery vehicle to travel. On delivery, the poles will be transported to their respective Active Work Locations using the appropriate tracked excavator for that Active Work Location.

2.4.3.4 Pole Erection

The Pole erection team will arrive at their Active Work Location following pole delivery. The pole erection team will remove and set aside the top soil, within the defined work area, before excavating the foundation for the pole, use an attachment on the tracked excavator to lift the pole into position and then backfill and compact the foundation of the pole. All excavated material will be used as backfill, with no imported backfill or concrete being required and no spoil will be removed from the site.

Where rock breaking is required during excavation, a rock breaker attachment will be used on the tracked excavator. Due to the small footprint of the excavation required, use of a rock breaker will be limited to a short duration for a maximum of 3 days. All broken rock will be used to backfill the pole foundation. Rock breaking will only take place between 09:00 – 17:00 hours on Monday to Saturday with no such work on Sunday, to ensure that any noise impact is short term, localised and within working hours. Construction works will be undertaken in compliance with *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites.*

Typically pole erection will be completed within a day, therefore excavated material will not be left uncovered for more than a day. In the event that pole excavation should take longer than one day, excavated material will be covered with suitable waterproof material (heavy duty plastic sheeting or tarpaulin).

The pole erection team will then move on to the next structure in the Active Work Section which then becomes their new Active Work Location.

2.4.3.5 Overhead Line Stringing

Following completion of the pole erection across a Line Stringing Section, the Line Stringing Section becomes the Stringing Team's Active Work Location. The team will begin by threading a steel wire bond along the overhead line route on top of the poles. The bond is attached to the conductor at the conductor tensioner. The conductor tensioner is positioned at one end with a conductor puller at the other. The bond is attached to the puller which then pulls the bond through the overhead route which in turns pulls the conductor. The tensioner/puller system ensures that the stringing is done under tension and that the conductor does not come into contact with the ground or any existing features. When the conductor is strung on top of the poles, the linespersons then climb each pole to tie the conductor to the poles. When this work is complete, the equipment can then be removed along with any temporary stays. Ancillary equipment as per the relevant pole specification for each pole can then be fitted; this includes warning signs, pole number identification and anti-climbing devices. The Overhead Line Stringing Team can then move on to their next Active Work Location.

For Overhead line stringing across the Owenkillew River, a drone will be employed to ensure no disturbance to the river. This will involve an initial pull through of a fishing line by drone, the fishing line will then be used to pull through a rope at tension, with the rope used to subsequently pull through the bond at tension so that nothing comes into contact with the river or river banks at any time. As this work will be completed under tension, as per above, all equipment will maintain clearance to the river surface.

2.4.3.6 Site Demobilisation and Restoration

Vehicles and plant will be removed from the Active Work Section and moved to the next Active Work Section. All lands will be reinstated to prior condition. Hand brushes will be used to clean public carriageway or hard standing areas where required.

2.4.3.7 Construction and Access Audit

The Construction and Access Audit team will follow after completion of the Overhead Line Stringing Team. They will audit the technical construction of the line and also the access and egress of the previous teams. Adherence to required procedures and site rules as defined within the OCEMP, will also be monitored via regular audits carried out by the NIE Networks Environmental Officer and the ECoW on all Active Work Locations. These audits will occur, at a minimum, every two working days during tree cutting, pole erection and at least once a week during overhead line stringing activities

2.4.4 Overhead Line Materials and Vehicles

2.4.4.1 Materials

Materials that will be used in the construction of the overhead line are as follows:

A. Wooden poles
B. Steel cross arms
C. Wooden baulks for use in pole and stay foundations
D. Stay wire
E. Porcelain and Polymeric Insulators
F. Nuts and bolts
G. Anti-climbing devices (barbed wire, yellow warning signs and emblems)

All excavated material will be reinstated with the ground reinstated to its prior condition.

2.4.4.2 Overhead Line Construction Vehicles and Plant

The construction vehicles to be used for the construction of the overhead line do not present any significant impact to the existing road network and agricultural accesses with no requirement for road widening to accommodate vehicle movement and access.

2.4.5 Overhead Line Construction Welfare and Site Facilities

All construction activities will be in accordance with the Construction (Design and Management) Regulations (Northern Ireland) 2016.

2.4.5.1 Main Site Compounds and Welfare Facilities

Two main compounds will be used to service the construction of the Overhead line. These will be NIE Networks Omagh Depot and a temporary compound at the proposed Curraghinalt Mine site which will fulfil the function of a site office to allow for briefing, health and safety, welfare and secure vehicle storage. Sewage effluent from the temporary site compound will be removed using a vacuum tanker.

Upon completion of the works, the temporary site compound at the Curraghinalt Mine site will be removed and the land will be reinstated to its former condition or handed back to the landowner to be developed in accordance with the proposed Curraghinalt Mine planning application.

2.4.5.2 Active Work Section Welfare

In order to cater for the welfare of persons working on the construction of the Proposed Development, a mobile welfare van will be positioned either within the Active Work Section or, where there is an area available for parking vehicles in close proximity to the Active Work Section, that area may also be used. The vehicle will be returned to the vehicle owner's depot (the vehicle will be hired from a suitable hire facility) for removal of sewage on a daily basis. Refuelling will be at publicly accessible fuel stations and will not occur on site. This welfare van will also serve as a local mobile site office as the construction activities move along the Proposed Development.

2.5 Underground Cable Construction Methodology

2.5.1 Underground Cable Construction

The following sets out both the construction concepts associated with the underground cable construction and the sequence of construction for the installation of the underground cable element of the Proposed Development.

The proposed underground cable construction works are entirely routine both in the context of NIE Networks day to day construction of the distribution network but also in the wider utilities services industry.

The proposed methods of trench excavation both (within and outside roads and carriageways), *open cut* crossing of watercourses and directional drilling (beneath watercourses) are techniques which are utilised in the construction and installation of electricity, telecommunications, gas and water services throughout Northern Ireland.

Horizontal Direction Drilling (HDD) is common practice across the electricity industry for underground cable installation below watercourses but also railways and roads; NIE Networks have undertaken approximately 40-50 HDD installations in recent years.

HDD is commonly used across water and gas utilities with a substantial number (if not the majority) of underground water and gas pipes being installed using HDD.

2.5.2 Active Work Location

Due to the nature of construction of underground electricity cables, the Proposed Development will be constructed progressively along the proposed route in a sequential fashion, with the Active Work Location progressively moving along the route as the installation is completed.

For underground cable installation, the installation and therefore the Active Work Location will typically progress at a rate of 1km per month and no more than 2km per month. The majority of the proposed underground cable will be installed in public carriageway. The detailed programme for this installation will be agreed in consultation with DfI Roads in order to minimise any traffic disruption. Further assessment of traffic is provided in Chapter 15 of the ES. The linear distance of an underground cable Active Work Location is approximately 100m.

Should any road closures be required, then these will be agreed with DFI Roads in advance and all statutory advertisements will be adhered to. Appropriate diversion routes will also be identified as part of this agreement whilst ensuring full access is retained for local residential access and emergency vehicles at all times through the use of steel plates which will be held on site. The following should also be noted;

- length of working area to be subject to closure i.e. the underground cable section may be 3.60km (for example) in length but the closure will be restricted to length of carriageway located within the identified diversionary routes. Within this closure zone, the working area will be localised to c.100m progressing daily, based upon standard open cut trenching detail, relative to the section of road being worked upon;
- maintaining access for emergency vehicles, agricultural and residential properties. Any entrances where open cut trench is being carried out, or where the trenching crosses the road, steel plates will be held on site and can be laid across the trench to maintain access for emergency, agricultural and residential properties.
- typical duration of closures in a working day – i.e. will full access be available outside proposed construction working hours. For a single lane closures, access will be maintained with portable vehicular traffic signals which will be automatic sensor based. For full road closures, full local and emergency access will be available throughout, including outside of working hours, by provision of steel plates across accesses where required, and chicane barriers to allow passage for local/emergency vehicles. Should road closures be required on B Class roads, restricted working hours from 9am to 4pm will apply, with the road remaining open to all traffic outside these hours.

Should road closures be required then the duration of any closures have been identified whilst taking account of the notes above. Proposed diversion routes have been considered for each of these sections. Estimated durations for road closures to facilitate the installation of each underground cable section are as follows:

- Underground cable section A: c 3.60 km from Strabane Main Substation to terminal pole number 2001 located in field adjacent to Hollyhill Road: Estimated road closure duration of up to 4 months.
- Underground cable section B: c 0.342km from terminal pole number 2137, located in the field adjacent to Meendamph Road, to terminal pole number 2138, also located in the field adjacent to Meendamph Road. Estimated road closure duration of up to 2 weeks.

- Underground cable section C: c 0.103km crossing underneath the Landahussy Road between terminal poles 2201 and 2202. Estimated road closure duration of up to 1 week.
- Underground cable section D: c 1.6km from terminal pole 2248 adjacent to Glenforan Road, to terminal pole number 2251, located in lands adjacent to Meenadoo Road. Estimated road closure duration of up to 2 months.
- Underground cable section E: c 0.993km from terminal pole number 2261, located in agricultural lands accessed from Glenforan Road, to terminal pole number 2262, located in lands adjacent to Gorticashel Road. Estimated road closure duration of up to 2 weeks.
- Underground cable section F: c 1.9km (of 4.23km) from terminal pole number 2322, located in agricultural lands adjacent to Crockanboy Road to the entrance to proposed Curraghinalt Mine. Estimated road closure duration of up to 2.5 months.

Note that the remainder 4.23km of underground cable is within the proposed Curraghinalt Mine development or on agricultural lands i.e. outside the public carriageway.

Note that the underground cable section between poles 2154 and 2155 is located within agricultural land and does not require any road works.

2.5.3 Underground Cable Work Teams

A typical Underground Cable Work Team will consist of no more than 8 persons. Team members will sign onto the Active Work Location at the beginning of each working day at the Mobile Site Office. They will assemble at their employer's place of work and travel to the site. The Mobile Welfare Vehicle will be used to transport the work team to site. An additional designated vehicle may also be used as necessary to transport members of the work team and hand tools. This additional vehicle will be no larger than a typical 6 person light commercial vehicle.

2.5.4 Work Team Awareness and Monitoring and Control

During the initial site induction, all staff will be briefed by the appointed NIE Networks Site Manager on the required measures at each site to ensure integrity of existing habitats and species during the construction phase and on the measures required to maintain the controls when staff are not on site.

A notice board will be erected at each access point which will identify key staff, environmental requirements and relevant contact numbers.

All site visitors will be briefed on the site specific environmental considerations by the appointed Site Manager and Environmental Officer and advised of the required control measures at that particular site.

Prior to work commencing each team will receive a Tool Box Talk (local staff briefing in NIE Networks depot or on site) on the proposed day's activities specific to their work site. The information will include advice from the NIE Networks Environmental Officer and the ECoW. The Tool Box Talk session will be carried out by the appointed Site Manager.

Adherence to required procedures and site rules will be monitored via regular audits carried out by the NIE Networks Environmental Officer and the ECoW. These audits will occur, at a minimum, every two working days during underground cable construction activities.

A monthly report will be compiled to outline audits completed and will identify remedial actions taken on site to ensure compliance with required procedures. This report will include environmental aspects such as incidents, near misses, waste disposal records and environmental tool box talks.

2.5.5 Underground Cable Construction Sequence and Construction Methodology

2.5.5.1 Underground Cable Construction Sequence and Construction Methodology

2.5.5.1.1 Site Access and Engagement with Third Parties

Where the Underground Cable is being installed on public roadways, site access will be via the public roadway. Where the Underground cable is being installed on private ground, access will be via existing access routes.

The construction vehicles that will be used for the construction of the underground cable will not result in any significant impact to the existing road network and agricultural accesses.

2.5.5.1.2 Intrusive Ground Investigation

Extensive non-intrusive surveys and inspections have been carried out in order to inform underground cable design and construction methodology, identifying all potential constraints and therefore all potential construction methodologies that may be required. Only the construction methodologies contained within the ES will be employed and the impacts of these methodologies have been fully assessed within the ES.

Intrusive ground investigation will take place a number of months prior to excavation and installation works commencing in order to identify the most appropriate construction methodology from the palette of available construction methodologies. Intrusive ground investigation works will consist of approximately 2m^2 trial holes which are used to determine ground conditions and the precise location of existing services and structures. There will be approximately 1 trial hole per 100m of underground cable (c85 total) and the duration of investigation works will be approximately 15 (potentially non-consecutive) working days for a single 2 person digging team with a 13 tonne excavator

2.5.5.1.3 Machinery, Vehicle and Equipment Mobilisation

The machinery, vehicle and equipment involved in the construction of the Underground Cable are described in more detail in the Volume III, Appendix 2.2 OCEMP, Appendix C.

2.5.5.1.4 Excavation

A cable track of 1000mm deep by 500mm wide will be excavated along the proposed route as shown in drawing number CW33-1D.

For excavation on the public carriageway, safe digging practices will be strictly adhered to. All open excavations will be fully cordoned off with appropriate, temporary, mobile barriers, to prevent falls into the excavation. The site will be monitored and maintained in a safe condition at all times. All spoil generated during excavation is expected to be unsuitable for reuse as backfill and will be removed using a dumper and/or grab lorry. Excavated material will be drawn to a registered disposal site.

For excavation on agricultural lands, top soil will be stripped and stockpiled adjacent to the works and will be re-used when re-instating the trench. Other excavated material will be stockpiled separately within the identified working area and will be re-used as backfill.

Alternative construction methodologies may be required where there are specific existing features (e.g. watercourse, pipes, culverts) in the ground; details of these features are provided in Table 2.1 below, with relevant alternative methodologies provided in Volume III, Appendix 2.2 OCEMP, Appendix D; the impacts of these methodologies have been fully assessed within the ES.

2.5.5.1.5 Duct Installation

6m long, 100mm diameter, red, class 1, PVC ducts will be installed in the excavated trench.

Installation will be carried out as follows:

- Sand inserted on the bottom of the trench

- Manual laying of ducts
- Sand placed on top of ducts
- Marker tiles placed on top of sand
- Sand placed on top of marker tile
- For cable installed in the public carriageway: backfill as per Northern Ireland Road Authority and Utilities Committee Specification for the Reinstatement of Openings in Roads (2nd Edition)[1]
- For cable installed in private agricultural ground: backfill using excavated material.

2.5.5.1.6 Reinstatement

For cable installation in the public carriageway reinstatement will be to finished ground level. Materials for reinstatement will be sourced from licensed / approved quarries.

For cable installation in agricultural lands, top soil will be re-instated to finish the trench to ground level. This will be re-seeded.

2.5.5.1.7 Excavation of Cable Pulling Pits, Cable Installation and Jointing. Reinstatement of Cable Pulling Pits

Following the installation of the ducts and the reinstatement of the cable track, cable pulling pits will then be excavated along the cable track in order to pull the cable through the ducts and join the sections of cable together.

Following pull through of the cable, the pulling pits are then reinstated as per the methods above.

2.5.5.1.8 Material, Machinery and Equipment Demobilisation

With the cable at an Active Work Location constructed, the Material, Machinery and Equipment will be demobilised and will then be used at the next Active Work Location. Hand brushes will be used to clean the public carriageway or hard standing areas where required; mud will be brushed back into adjacent agricultural land.

2.5.6 Alternative Underground Cable Construction Methodologies for Location Specific Requirements

At the locations ST2, ST3, ST5, ST6, ST7, ST8, ST9, ST10, ST10b and ST 11 as shown in drawing numbers 698-1-1 - 698-1-4, the construction of the underground cable will be carried out as per the aforementioned methodology activities set out in 2.5.5.1.1 – 2.5.5.1.3; following this, the alternative methodologies referred to in Table 2.1 below and detailed Volume III, Appendix 2.2 OCEMP, Appendix D, will be undertaken.

[1] https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/nirauc-code-of-practice-specification-for-the-reinstatement-of-openings-in-roads-2nd-edition.pdf

Table 2.1: Summary of Alternative Underground Cable Construction Methodologies

Underground Cable Section Area	Location Reference	Feature	Methodology for Underground Cable Installation
Area A: Strabane Main Section Refer to drawing no. 689-1-1	ST2 (ch2790m)	Culvert (Concrete Pipe)	Either: 1. Alternate Methodology A: Excavation and Installation around and below a structure or; 2. Alternate Methodology B: Directional drilling.
	ST3 (ch3370m)	Culvert (mixture of concrete and masonry)	Alternate Methodology C: Dam watercourse and install open trench through watercourse.
Area D: Meenadoo Road Section Refer to drawing no. 689-1-3	ST5 (ch450m)	Masonry Culvert (suspected to have collapsed and in poor condition)	Alternate Methodology B: Directional drilling
	ST6 (ch695m)	Masonry Culvert	Alternate Methodology B: Directional drilling.
	ST7 (ch895m)	Culvert (Concrete Pipe)	Either: 1. Install as per normal technique above the structure or; 2. Subject to condition of the road, Alternate Methodology B: Directional drilling.
	ST8 (ch980m)	Culvert (Concrete Pipe)	Either: 1. Install as per normal technique above the structure or; 2. Subject to condition of the road, Alternate Methodology B: Directional drilling.
	ST9 (ch1100m)	Culvert (Concrete Pipe)	Either: 1. Install as per normal technique above the structure or; 2. Subject to condition of the road, Alternate Methodology B: Directional drilling.
	ST10 (ch1230m)	Culvert (Concrete Pipe)	Either: 1. Install as per normal technique above the structure or; 2. Subject to condition of the road, Alternate Methodology B: Directional drilling
	ST10b (ch1450m)	Open watercourse	Either: 1. Alternate Methodology C: Dam watercourse and install open trench through watercourse or; 2. Alternate Methodology B: Directional drilling.
Area E: Glenforan Road Refer to drawing no. 689-1-3	ST11 (790m)	Culvert (mixture of concrete and masonry)	Either: 1. Alternate Methodology C: Dam watercourse and install open trench through watercourse or; 2. Alternate Methodology B: Directional drilling

2.5.7 Active Work Section Welfare

In order to cater for the welfare of persons working on the construction of the Proposed Development, a mobile welfare van) will be positioned on the public road, within the designated road closure area, adjacent to the Active Work Section and within the designated work area. The vehicle will be returned to the vehicle owner's depot for removal of sewage. Refuelling will be at publicly accessible fuel stations and will not occur on site. This welfare van will also serve as a local mobile site office as the construction activities move along the route of the Proposed Development.

2.5.8 Underground Cable Construction Vehicle and Plant

Wheeled excavators will be used on public carriageway, with tracked excavators used on agricultural lands. Note that the size of excavators that will be used for underground cable sections are typically smaller (but no larger) than for overhead line construction as they are not required for the handling of wooden poles.

2.6 Other Construction Matters

2.6.1 Construction Programme Schedule

Allowing for weather conditions to ensure the best working environment, it is envisaged that the total time to complete construction will be in the region of 12-18 months.

Construction works will only take place between the hours of 07:00 – 19:00 hours on Monday to Friday, 07:30 – 17:00 hours on Saturday with no such work on Sunday. Further reduced operational hours for specific construction activities are defined within Section 2.4.3.4. Outside these hours, work on site will be limited to emergency works.

2.6.2 Construction Traffic

Conservative 'worst-case' estimates of cumulative traffic for the construction phase traffic are provided in Table 2.2 below; it is envisaged that the total traffic will be significantly less than the figures stated.

A trip refers to travel between either the NIE Networks office in Omagh or the temporary site compound at the proposed Curraghinalt Mine site, to an Active Work Section. Due to the moving nature of the Active Work Section, as the Proposed Development is constructed, the cumulative number of trips will be split across various locations along the c37.9km route.

Table 2.2: Estimated Construction Phase Traffic

Estimated Construction Phase Traffic - On Public Carriageways			
Vehicle Type	**Estimated maximum total number of trips through duration of construction phase**	**Estimated Average trips per week through duration of construction phase (12-18 months)**	**Estimated Average trips per day through duration of construction phase (12-18 months)**
Light commercial (e.g. van or linespersons 4x4)	7120	148 - 99	27 - 22
Heavy goods (e.g. 16T grab lorry, Road Tractor with low loader, 14-26T Flatbed lorry with crane arm)	2440	51 - 34	9 - 6
Estimated Construction Phase Traffic - On Agricultural Access Way			
Vehicle Type	**Estimated maximum total number of trips through duration of construction phase**	**Estimated Average trips per week through duration of construction phase (12-18 months)**	**Estimated Average trips per day through duration of construction phase (12-18 months)**

Light commercial (e.g. van or linespersons 4x4)	3000	63 - 42	11 – 8
Agricultural Tractor	150	3 - 2	<1
Tracked Excavator	640	13 - 9	3 - 2

2.6.3 Operation and Maintenance Traffic

Operation and maintenance traffic will only include light commercial vehicles and is estimated to consist of an average of 6 trips per year to various points along the c37.9km route.

2.6.4 Decommissioning Traffic

Should the development be required to be decommissioned, the traffic levels are expected to be significantly less than those required for the construction phase; underground cable and associated ducts will not be removed via trench excavations in the same manner as required for construction whilst poles will not be removed through excavation, instead being cut off at ground level. Decommissioning impacts will be less than the impact of construction.

2.6.5 Sewage from Temporary Compound

Sewage effluent from the temporary site compound will be removed using a vacuum tanker by a suitable licensed waste contractor.

2.7 Project Need

The Proposed Development will provide a new 33kV distribution power line from the existing Strabane Main substation to the proposed Curraghinalt Mine; the development will be constructed and operated by NIE Networks.

This application is being made under NIE Networks statutory and regulatory obligations as set out in the Electricity (Northern Ireland) Order 1992 and NIE Networks' Distribution Licence.

The power line is required by the proposed Curraghinalt Mine in order to provide it with the power that it requires to function.

3 ALTERNATIVES

3.1 Introduction

This chapter outlines the 'reasonable alternatives' considered in the design of the Proposed Development and identifies the reasons for the final selection. These alternatives include selection of the route, the voltage of the connection, overhead versus underground cables, the detailed design options within the wider overhead and underground options and alternative working methods.

This "*do nothing scenario*" is an assessment of the likely environmental effects that will ensue in the event that the Proposed Development are not taken forward.

NIE Networks have a legal obligation under Article 19 of The Electricity (Northern Ireland) Order 1992 to provide a connection to any party who applies for the same. In that context, and further in the context that the proposed Curraghinalt mine is approved, NIE Networks must fulfil its statutory obligation to provide a connection, meaning that a "do nothing" scenario cannot be considered a feasible policy option.

Without prejudice to that position, the assessments in individual chapters are based on consideration of the current baseline scenario and how that baseline is likely to evolve in the absence of the Proposed Development. The assessments are based on the considered view that, given the prevailing planning policy, the natural evolution of the baseline environment in this rural area is likely to be feature primarily single dwellings, further agricultural developments and modest extensions to existing and approved major developments identified in the cumulative impact assessments in each chapter. It is assumed that existing and approved major projects will remain as a feature in the environment for a minimum of 25 years.

3.2 Methodology

3.2.1 Design Considerations

The specific project design requirements of the supply are based on the bespoke electrical requirements of the proposed Curraghinalt mine project, while also meeting all relevant NIE Networks policies, specifications, standards and relevant safety requirements.

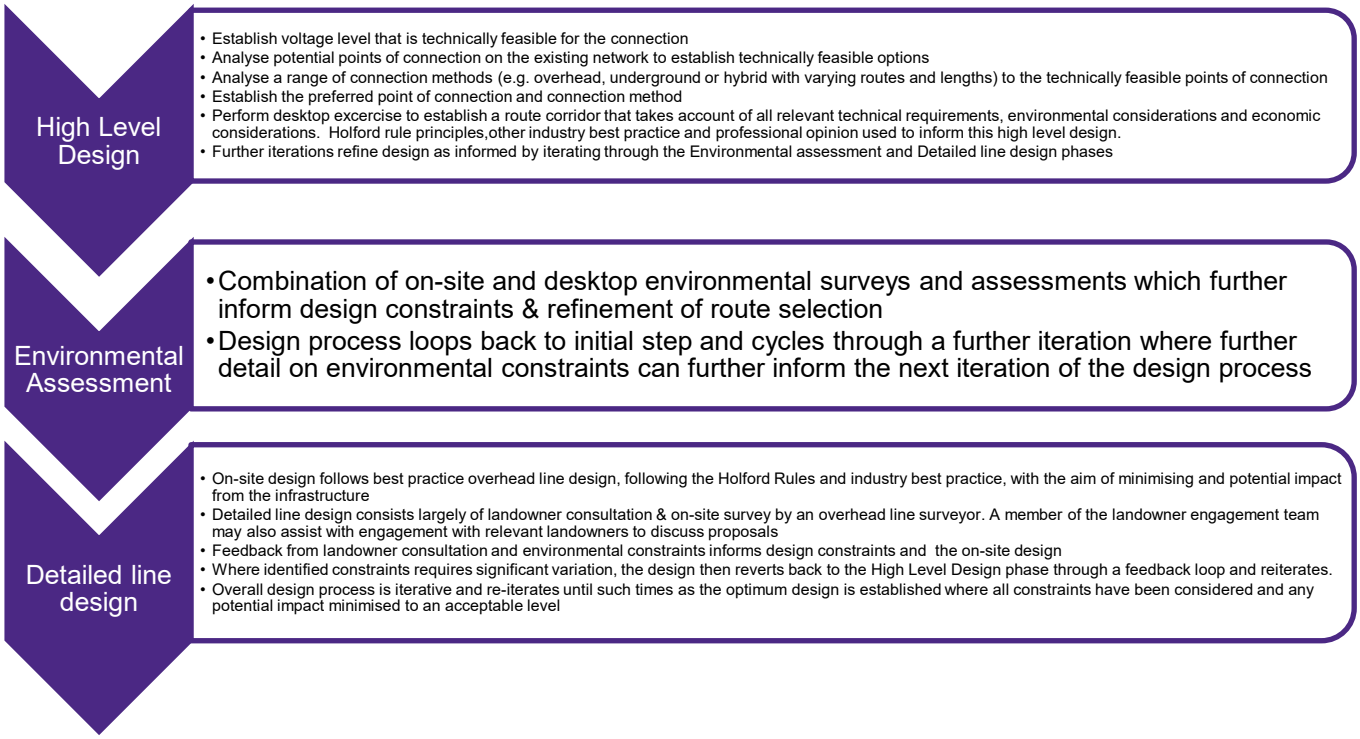

Figure 3.1: Summary of the Route Selection & Design Process

Environmental considerations are considered alongside the NIE Networks' legal obligation (under the Electricity (Northern Ireland) Order 1992) to offer the NI customer the 'least cost, technically acceptable' solution for a new connection or alteration to the electricity network to facilitate development. In that context the primary objective in routeing a cross-country electricity connection is to provide the shortest connection between the two end points, consistent with technical considerations and the objectives of avoiding, preventing, reducing associated environmental impacts.

Selection of the route was based on a process that started with a "Study Area/Area of Search" that was as broad as was technically feasible. This area was then narrowed down through due consideration of technical, environmental and landownership issues. The stages in the route selection process are outlined below:

- Confirmation of start and end points of the connection;
- A broad Study Area/Area of Search was defined between the end connection points;
- The Study Area was refined into a Route Corridor through application of the Holford Rules[2] of relevance to this high level stage of the selection process, namely:
    - Avoiding, where possible, of the major areas of high amenity value.
    - Avoiding smaller areas of high amenity value, or natural and cultural heritage interest by deviation.
    - As far as possible choosing the most direct line, minimising sharp changes of direction.
    - Preference for moderately open valleys with woods where the apparent height of the poles will be reduced, and views of the line will be broken by trees.
    - Keeping high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, to as far as possible avoid a concentration of 'wirescape'.
- The preferred connection route was further developed through evaluation and balancing of a combination of environmental, technical and landownership/availability issues informed by walk over surveys/site visits and detailed assessments as described in the ensuing sections of this chapter.

The above process is iterative and was re-iterated until such times as all likely significant environmental impacts were avoided or effectively mitigated.

3.2.2 High Level Design

Voltage Level

The first design consideration is determining the appropriate voltage for the proposed connection as this has a significant impact on the connection design. There are essentially two options for this project – 110kV or 33kV connection, with any 11kV option being dismissed due to not being technically capable for this type of installation.

The customer in this instance requires a Maximum Import Capacity (MIC) in the region of 12 MW. A 33kV was determined to be the most appropriate connection voltage as it can meet this capacity requirement and also will result in reduced environmental impacts in comparison a 110kV connection through use of wooden poles rather than a combination of larger wooden and steel structures which would likely result in greater impact upon environmental constraints and be more visually prominent.

On that basis it has been determined that the proposed connection voltage should be 33kV; this is the smallest voltage level for the type of supply required to meet the technical requirements as specified by the mine project and is the preferred technology from an environmental and technical perspective.

2 National Grid plc: The National Grid Company plc and new high voltage transmission lines – guidelines for line routeing (the Holford Rules) and undergrounding: March 2003.

Potential Connection Points and Overview of Route

The first consideration is to look for the closest point of connection for the chosen voltage.

It is not technically feasible to supply the technical requirements of the mine from an existing 33kV circuit due to those circuits having inadequate capacity.

The 33kV connection must then be supplied from a Bulk Supply Point (BSP). A BSP is a 110/33kV network node, where the distribution network (33kV and below) is fed from the transmission network (110kV and above).

Figure 3.2 below shows the location of the nearest BSP's in relation to the proposed mine development (where the mine development is indicatively represented by a light green pointer and BSP's represented by multi-coloured circles).

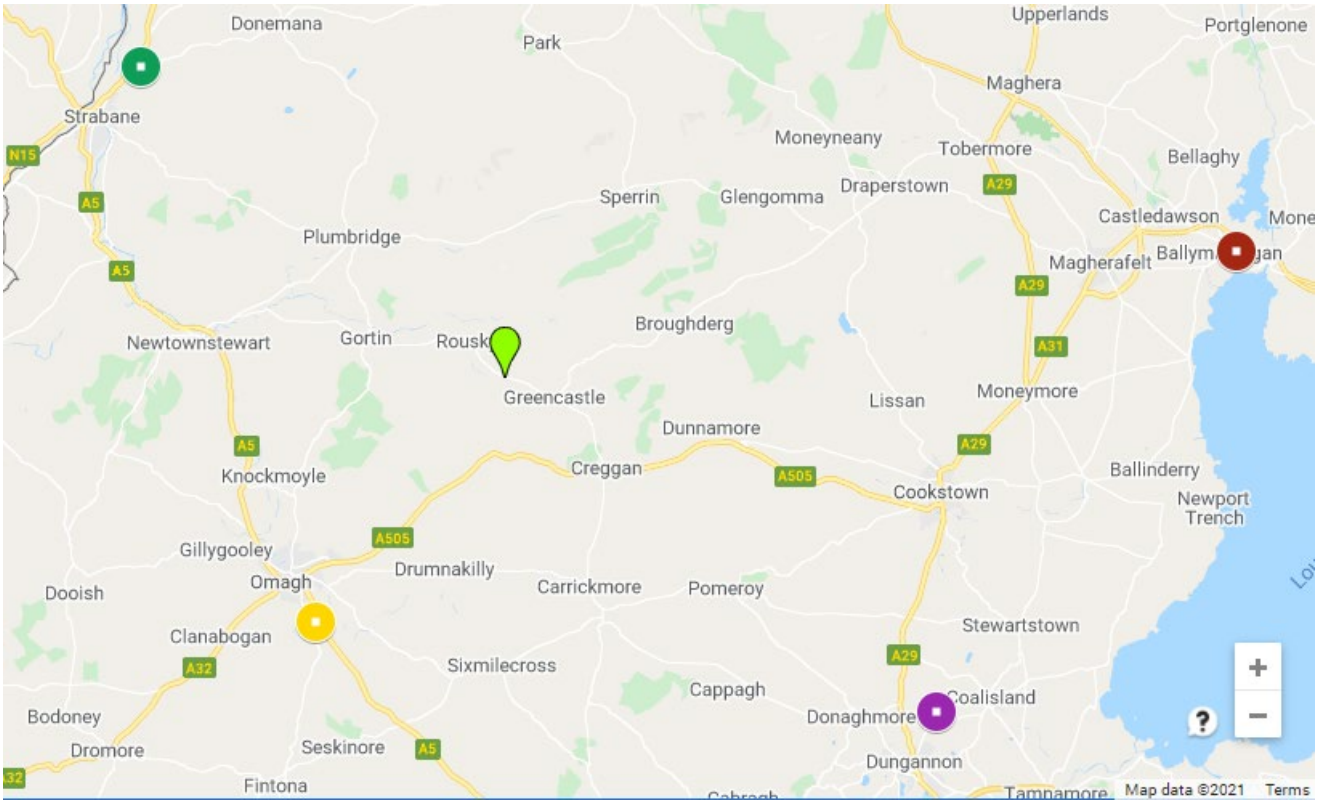

Figure 3.2: Options for Bulk Supply Point

The names and approximate straight line distance between the proposed mine site and the relevant BSP are shown in Table 3.1.

BSP Name	BSP Colour Symbol (ref Fig 3.2 above)	Approx. Straight line distance
Strabane Main	Green	26km
Omagh Main	Yellow	17km
Dungannon Main	Purple	30km
Creagh Main	Red	41km

Table 3.1: Bulk Supply Points & Distance to Mine

Following a preliminary review on the basis of technical feasibility, two options for a connection point emerged for more detailed analysis, namely Omagh and Strabane. Both Dungannon Main and Creagh Main were dismissed based on technical feasibility, namely a lack of capacity at Dungannon Main and excessive distance to Creagh Main.

The Omagh and Strabane options were further evaluated on the basis of technical and environmental considerations and the existing NIE Networks Strabane substation was selected as the connection point for the Proposed Development for the following environmental and technical reasons:

- While either starting point will result in the route passing through the Sperrin Area of Outstanding Natural Beauty (AoNB), a route from Omag Maon would also pass through/close to Mullaghcarn Area of Special Scientific Interest (ASSI) and Murrins ASSI. A route from Strabane to the Dalradian mine is well removed from any ASSI designation.
- The electrical infrastructure at Omagh Main cannot accommodate the connection without an extension to the existing facility which would result in increased environmental impacts over and above what will arise if the Proposed Development connects from Strabane.
- The extension that would be required to Omagh Main would also potentially require significant alterations to the existing overhead and underground electrical infrastructure that emanates from Omagh Main. Any such extension is also not feasible due to difficulties around topography and potential land availability issues.
- A number of the 33kV circuits leaving Omagh Main have previously required substantial lengths of underground cable to be laid because the area is already heavily congested with overhead lines. The local road network is also heavily utilised for existing underground infrastructure and would have limited capacity to carry any additional underground circuits.
- Strabane Main can provide the required connection utilising short lengths of underground cable before converting to overhead line.
- The more modern switchgear at Strabane Main is easier to source and would be a more cost-efficient option to serve the Proposed Development.
- The 33kV switch room at Strabane Main can accommodate the connection without additional civil costs.
- The anticipated overall cost of a 33kV connection to Strabane Main would be similar to the cost of a 33kV connection into Omagh Main but the environmental and technical factors favour selection of the Strabane alternative.

Route Selection Study Area & Corridor Definition

Having established the preferred starting point, NIE Networks identified a broad study area (c.10kms wide) between the start and end point of the proposed connection, encompassing a geographical spread considered sufficient to deliver a potential route corridor that, as far as possible, avoided prominent slopes, hill tops, natural and cultural heritage designations and to overcome any technical issues.

The study area was further refined down to a preferred route corridor through application of the principles from the Holford Rules and consideration of environmental issues as outlined further below with the aim of establishing a corridor that avoids, prevents, or reduces likely significant environmental impacts. The process examined a series of constraints including topography, the existing electrical network, natural heritage and landscape designations, known cultural heritage assets, the water environment, flood risk and transport network. The key considerations are outlined below:

1. Avoiding altogether, if possible, the major areas of highest amenity value. To that end a major consideration was defining a corridor that provided opportunities to navigate through the Sperrin AoNB using lower slopes where a 33kV line would not be conspicuous in the host landscape. The preferred route therefore avoided the central core of the study area encompassing the higher ground characterised by a series of hilltops and instead veered north of and around the higher ground through a corridor where the local landscape encompasses changing topography, field boundary hedgerows, woodland planting, commercial forestry, and where there is already a level of electrical infrastructure that means the Proposed Development will not be a new or alien introduction to the landscape. In selecting the route corridor these factors were considered to offer optimum prospects to accommodate the development without resulting in substantial detrimental impacts on the character of the AoNB.
2. Avoiding smaller areas of high amenity value, or scientific interests by deviation. The selected route corridor avoids ASSIs and other nature conservation designations with the exception of the Owenkillew River Special Area of Conservation (SAC) which flows directly across the study area, avoiding Historic Parks & Gardens, and as far as possible the setting of areas of architectural, historic and archaeological interest.
3. Other things being equal, choose the most direct line minimising any sharp changes of direction.
4. Choosing a corridor encompassing tree and hill backgrounds which could be used in preference to sky backgrounds wherever possible, minimising the need to cross ridges and utilising opportunities to cross ridges obliquely where such a crossing was deemed to be unavoidable.

5. The opportunity to utilise moderately open valleys with trees, hedges and woodlands where the apparent height of poles will be reduced, and views of the line will be broken by trees. In the chosen corridor the landscape already successfully absorbed the local road network due to a combination of topography and existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.
6. Consideration of the existing electrical network in selecting a corridor where such infrastructure is not an alien feature in the landscape and still has capacity for further development sufficiently removed from the existing network to avoid issues of converging routes, distribution poles and other masts, wires and cables which comprise the existing NIE Networks 11kV, 33kV and 110kV network in the area.

3.2.3 Route Selection & Detailed Line Design

Overhead versus Underground Cable Solution

Under NIE Networks Policy the design of 33kV long cable connections, up to a maximum route length of 35km, is required to take account of limitations in respect of capacity and voltage drop/rise.

A detailed analysis with regards to the technical requirements of the mine and the technical design parameters concluded that a fully undergrounded 33kV connection between the mine and Strabane substation, is not technically feasible due to the 35km maximum route length limit. An approximate route length of 38km would require a charging current well in excess of the limit for a cable only network.

Underground cabling also has the potential to result in a greater environmental impact in the delivery of this project by virtue of potential damage to undiscovered archaeological remains and the potential impact on fisheries, aquatic ecology and the water environment generally.

As confirmed in the assessment of potential impacts on cultural heritage in Chapter 6 of this ES, it is considered that the study area has potential to reveal hitherto unrecorded archaeological remains. The construction phase in respect of pole and overhead line installation involves limited, targeted ground excavation for the purposes of erecting wooden pole-sets, with ground reinstatement therein. The proposed underground cabling will involve a continuous ploughed 500mm wide trench at 1m depth with increased risk to undiscovered features.

Underground cabling also potentially presents a greater threat to fisheries, aquatic ecology and the water environment, including the Owenkillew River SAC. Construction works have the potential to cause deterioration of water quality in tributaries of the Owenkillew River where OHL and UGC infrastructure is within close proximity to the watercourse or at watercourse crossings. For the Owenkillew and Glenelly River crossings, it is considered that the option that maximises protection of the sensitive environment is use of overhead lines rather than underground cabling.

The high level design therefore proposed an all overhead line solution which was subject to further iterations as described further below.

Detailed Line Design

Early detailed line design took account of the Holford Rules which are used by NIE Networks as a tool alongside consideration of environmental issues and landowner discussions to select and assess potential route options for overhead power lines with the aim of avoiding, preventing, or reducing likely significant environmental impacts.

Environmental Considerations

Further to completion of environmental constraints mapping in respect of the line route established in December 2016, environmental surveys were undertaken, commencing in March 2018, for a range of topics to include terrestrial ecology, ornithology and cultural heritage.

Constraints which were identified during the environmental surveys were fed into the detailed design development process influencing changes to the proposed route alignment and placement of pole locations. Constraints identified comprised the following:

- **Northern Ireland Priority Habitats** – e.g. blanket bog and broadleaf woodland. Placement of poles between pole 2027-2098 and 2105-2106 was designed to avoid direct impact in areas of blanket bog in this locale.

  Additionally, poles 2252 – 2253 and 2016 are located so as to avoid direct impact upon areas of broadleaf woodland in these locales.

- **Protected Species**. Poles 2287 – 2288 and 2254 – 2255 are placed to avoid impacts on areas of habitat with potential for marsh fritillary butterfly identified through field surveys. Pole locations were subsequently designed / located in order to avoid direct impact (within a 25m offset) on identified badger setts.

- **Cultural Heritage features**. The proposed route alignment and placement of pole locations was designed to avoid known heritage features identified at the desktop design stage and following identification of a previously unknown features through field survey, pole locations were chosen to avoid direct impact on the feature and minimise impact on its setting.

Land Owner Requirements

NIE Networks land officers / survey team carried out extensive discussions with land owners across the length of the Proposed Development, to firstly agree in principle, the placement of poles and the alignment of the route across private lands and to further discuss any revised positioning emerging from environmental fieldwork.

The placement of poles and alignment of the route was subject to detailed design with consideration given to land owner requirements, particularly with regards to compatibility with agricultural operations e.g. poles placed where possible at the edge of a field boundaries and so as not to hinder movement of farm vehicles and machinery, and to maximise the level of integration into the landscape all balanced alongside critical environmental considerations in respect of habitat, species, cultural heritage and water bodies.

Underground Cable Design

Although overhead lines are the preferred option for the environmental and technical reasons, underground cable sections have been developed in response to a number of environmental, technical and land owner requirements.

In total, c.11km of underground cable in the Proposed Development is split across 7 sections of the Proposed Development.

An underground cable connection is proposed from the existing 110/33kV Strabane main substation to the overhead line at pole 2001, between Hollyhill and Curlyhill Road to overcome technical difficulties in utilising an overhead line due to the congestion of overhead lines around the substation.

Where underground cables are proposed in the public road this will reduce visual impact associated with wirescape along public roads.

The underground cable is rated at 33kV and comprising of 3x240 mm^2 single core XLPE cables installed in 100mm diameter ducts with an additional 100mm diameter duct also laid as a spare duct for communication links. The cable trench will be no more than 500mm wide by 1000mm deep.

The underground cable section design is shown in drawing number CW33-1D *33kV Circuit Section*. Provision is made for alternative construction options, where required, as identified by completed road and watercourse surveys.

Chapter 2 Project Description of the ES summarises the alternative options for underground cabling that have been considered. Extensive non-intrusive surveys and inspections have been carried out at each location in order to inform the most appropriate underground cable design and construction methodology, taking account of all relevant potential constraints. These locations are shown in drawing number 698-1-1-4_20191128 Structures and Watercourse Crossings (Sheet 1 – 4).

In a number of instances intrusive ground investigation will take place a number of months prior to excavation and installation works commencing to confirm the most appropriate construction methodology at that particular location. In those instances, and, as confirmed in the Project Description, where the final method of construction has not yet been determined, the alternative options are clearly identified and all are assessed in the ES in a "*palette approach*".

For the purposes of the EIA a palette approach has been adopted where it has not been determined which of the potential construction techniques will be undertaken. The palette contains a number of options to cover all eventualities. All methods were included on the palette for the purposes of the EIA, which entailed an assessment of each of the proposed construction or crossing techniques to ensure a robust assessment of the potential environmental impacts.

Both of the proposed methods of trench excavation, open cut crossing of watercourses and directional drilling (beneath watercourses), are techniques which are utilised in the construction and installation of electricity, telecommunications, gas and water services throughout Northern Ireland.

Horizontal Direction Drilling (HDD) or directional drilling is common practice across the electricity industry for underground cable installation below watercourses and roads. HDD is an option for a number of crossings on the UGC route where the cable cannot be laid safely within the carriageway above a culvert or structure.

Open cut cable crossing options are proposed where the cable cannot be laid safely within the carriageway above a culvert or structure. The proposed use of temporary/coffer dams alternative at open-cut crossings is to ensure that there is a very low likelihood of sediment entrainment and the associated environmental impacts because excavation will be in non-flowing conditions.

Pole Design

The construction specification is a standard construction type. as specified by NIE Networks specifications and policies based on GB specification ENA TS 43-40 These specifications and policies have been derived through best practice, industry standards and compliance with all relevant regulatory and safety considerations The design is a mix of single and H (double) wood pole structures which are supported by stays at points where the overhead line route changes direction or terminates. Each wooden pole will have a 200mm head diameter. The pole heights will range from 11-20m, with the H pole consisting of 2 poles braced together 1.8m apart and a steel cross arm supporting the 3 phase conductors.

Variations between pole heights and type (single or double wooden pole) are determined by the design and technical requirements at each particular location. The height of poles (which range between 11 – 20m) is kept to a minimum so as to limit potential for visual impact and only increased for technical or safety requirements (e.g. The Electricity Safety, Quality and Continuity Regulations (Northern Ireland) 2012) or NIE Networks policy).

3.2.4 Proposed Design

Proposed Design – Planning Submission and Further Alternatives

The design of the Proposed Development, as subject to the planning applications of December 2019 (planning reference LA11/2019/1000/F and LA10/2019/1386/F), has been subject to the further consideration of alternatives following receipt of consultation responses from statutory bodies.

Following consideration of the response from the Department for Communities (DfC) Historic Environment Division (HED) dated 23rd July 2020 and further to discussions with HED, it was agreed revisions to the OHL should be made. A short section of the OHL (poles 2216 – 2228) has been moved to the southwest, lowering the elevation of the OHL and the amount of the line that breaks the skyline over Slievemore Hill and reducing the overall visual impact on the Scheduled Monuments in the landscape in views from the Scheduled Monuments (TYR018:008 & TYR018:056).

4 SCOPING AND CONSULTATION

4.1 Introduction

EIA is the process of compiling, evaluating and presenting the likely significant environmental effects of a proposed development.

Regulation 5(1)(b) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 (the EIA Regulations) states, inter alia: "An environmental impact assessment is a process consisting of - … (b) *any consultation, publication and notification required by, or by virtue of, these Regulations or any other enactment in respect of EIA development."* This chapter outlines the preparatory work undertaken to inform the EIA process, as well as the consultations undertaken with the DfI and relevant statutory and non-statutory agencies as applicable.

4.2 EIA Screening

4.2.1 EIA Screening Summary

A request for an EIA Screening Determination was submitted to the DfI in January 2020, pursuant to the terms of Regulations 8 and 12 of the EIA Regulations.

In accordance with Regulation 8(3), the request for a Screening Determination was accompanied by supporting information to include the following:

(a) A plan sufficient to identify the land;

(b) A description of the development, including in particular –

i. A description of the physical characteristics of the development, and, where relevant, of demolition works;

ii. A description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected.

(c) A description of the aspects of the environment likely to be significantly affected by the development;

(d) To the extent the information is available, a description of any likely significant effects of the Proposed Development on the environment resulting from –

i. The expected residues and emissions and the production of waste, where relevant; and

ii. The use of natural resources, in particular soil, land, water and biodiversity.

Regulation 8(4) provides that the applicant, when making a request for a screening determination, may also provide a description of any features of the proposed development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment. In that context the request for a formal screening determination was supported by submission of the following reports:

- Ecological Impact Assessment;
- Landscape and Visual Screening Assessment;
- Cultural Heritage Screening Assessment;
- Water Quality Screening Assessment;
- Fisheries & Aquatic Ecology Screening Assessment;
- Flood Risk Analysis (mapping);
- Outline Construction Environmental Management Plan (OCEMP).

The DfI issued its EIA Screening Determination on 8th December 2020. Within the body of the letter, the DFI stated the following:

"The Department is of the opinion that the proposed development would be likely to have significant effects on the environment and hereby determines that the planning application must be accompanied by an Environmental Statement."

In accordance with Regulation 16(5) of the EIA Regulations, NIE Networks provided confirmation of its acceptance of the DfI's decision, on 22nd December 2020.

4.2.2 DFI Statement on EIA Screening

Section 6 (paragraph 6.1) of the DfI's Screening Determination Report provides the following statement on the *main reasons for the conclusion* including reference to having regard to the environmental information submitted in support of the EIA screening request, stating also that consultee comments have been taken into account:

"In reaching the conclusion that the proposed project must proceed by way of an Environmental Impact Assessment, the Department has had regard to the environmental information submitted including in particular the Ecological Impact Assessment EcIA (with a confidential badger survey), Landscape and Visual Impact Assessment LVIA, Cultural Heritage Screening Assessment CHSA, Water Quality Screening Assessment WQSA, Fisheries & Aquatic Ecology Screening Assessment FAESA and the additional Fisheries & Aquatic Screening Assessment - Received 15.09.20 aFAESA, Flood Risk Analysis FRA and the Outline Construction Environmental Management Plan OCEMP. It has also taken into account consultee comment."

4.3 Additional Stakeholder Engagement

4.3.1 Pre-Application Engagement

Pre-application discussions were undertaken with NIEA Natural Environment Division (NED) to discuss the extent and scope of ornithological surveys to be undertaken in respect of the Proposed Development. A methodology, study area and timing for surveys was agreed with NED and subsequently employed in the completion of field work, informing the ecological survey for birds.

Additionally the British Trust for Ornithology (BTO) were also consulted, requesting breeding bird season data gathered during the Bird Atlas 2007-2011 within the area of the Proposed Development.

4.3.2 EIA Screening Stakeholder Engagement

During the processing of the DfI's EIA Screening exercise, a review was undertaken of consultee responses as received by the Department. Upon review, consideration was given to the content of Loughs Agency response with subsequent meetings undertaken between the applicant, members of the environmental consultancy team and DfI.

A subsequent updated Fisheries and Aquatic Ecological report was submitted, to address comments raised by Loughs Agency and included further data, compiled from further electrofishing surveys (under permit).

4.3.3 Additional Stakeholder Engagement

During the processing of the DfI's EIA Screening exercise, the opportunity was taken to complete additional ecological surveys which were not undertaken (due to access or seasonal restrictions) during the 2019 field work season, which informed the Ecological Impact Assessment report, submitted with the screening request; this information is provided within Chapter 7 Terrestrial Ecology and Ornithology.

Engagement with NIEA's Wildlife Licensing Team was undertaken in order to assist in the completion of targeted surveys during 2020 which were in addition to an updated extended phase 1 habitat survey, completed in the same year. Additional works included surveys for smooth newt and common lizard, badgers, marsh fritillary and bat roost (Potential Roost Features [PRF] inspection surveys); this information is provided Chapter 7 Terrestrial Ecology and Ornithology.

Also in advance of the submission of the EIA Screening request and in preparation of the Fisheries and Aquatic Ecological Screening Assessment, engagement was undertaken with Loughs Agency to obtain appropriate

permits to undertake electrofishing of targeted watercourses in proximity to the Proposed Development; this information is provided within Chapter 8 Fisheries and Aquatic Ecology.

4.3.4 Post EIA Screening Stakeholder Engagement

Upon receipt and review of the DfI's EIA Screening Determination and in consideration of the detailed content and volume of information provided by DfI and consultees, a formal EIA scoping was not undertaken. Alternatively a request was made for additional engagement with both the DfI and a number of consultees, in order to discuss specific matters raised and to agree an appropriate scope of works, to inform the preparation of the ES.

The following matters were the subject of further discussion and engagement with the relevant consultee / Department, NIE Networks and RPS (environmental consultants and sub consultants):

Consultee / Department	Discipline / EIA Topic
• DfI Planning • *DAERA*	Landscape and Visual
• DfI Planning	Outline CEMP
• DfI Planning • NIEA Natural Environment Division	Ecology
• DfI Planning • DfC Historic Environment Division	Cultural Heritage

The ES has been prepared in consideration of these matters and further discussion and engagement and addresses them accordingly.

5 LANDSCAPE AND VISUAL

This chapter presents the assessment of the potential landscape and visual impacts associated with the Proposed Development. The purpose of the Landscape and Visual Impact Assessment (LVIA) is to identify and determine the effects on landscape character, landscape features, visual receptors, and visual amenity as a result of the works associated with the Proposed Development. The assessment of effects has been undertaken for both the Construction Phase and Operational Phase of the Proposed Development.

The methodology and approach to assessment used within the LVIA has been developed from and carried out in accordance with best practice guidance described in *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (The Landscape Institute and Institute of Environmental Management & Assessment, 2013) (GLVIA3), *Visual Representation of Development Proposals* (The Landscape Institute, Technical Guidance Note 06/19, 2019) and *Residential Visual Amenity Assessment* (The Landscape Institute, Technical Guidance Note 2/19, 2019).

The landscape has been appraised to allow it to be described and classified into landscape character areas that in turn enable the classification of landscape quality. The capacity of the landscape to accept change of the type proposed is assessed by determining the sensitivity of each landscape character area.

Site visits were undertaken to assess the existing environment, to establish the existing visual resource and to identify sensitive receptors, i.e. residential properties, scenic viewpoints. Site visits were also used to establish the perceived extent of landscape and visual impacts that may be associated with the proposed development.

The Proposed Development and associated environs lies within areas covered by Fermanagh and Omagh District Council and Derry City and Strabane District Council the their associated Development Plans, which have been reviewed to establish and identify areas of protected landscapes or landscape designations that are relevant to the LVIA.

This review identified two Historic Parks and Gardens (HPG) that lie within proximity to the Proposed Development. The review also identified that the Proposed Development traverses the Sperrin Area of Outstanding Natural Beauty (AONB), crosses localised sections of The Ulster Way and a number of local Way Marked Trails, Cycling Trails and Scenic Driving Routes.

A review of the Northern Ireland Landscape Character Assessment 2000 (NILCA 2000) indicates that the Proposed Development traverses four Landscape Character Areas (LCA); Foyle Valley LCA (27); Sperrin Mountains LCA (29); Glenelly Valley LCA (28) and South Sperrin LCA (24).

A total of nineteen (19) viewpoints have been selected and assessed as part of the LVIA, with viewpoint locations selected to represent; views from where the main direction of the view is towards the Proposed Development, a range of views along the length of the Proposed Development, views representing areas known to be available to the community where people may frequently congregate and locations of interest e.g. settlements.

A Residential Visual Amenity Assessment has also been undertaken as part of the LVIA, with groups and individual properties identified and assessed.

With regards to predicted effects of the Proposed Development during the construction phase on designated landscapes, it is considered that the influence of the Proposed Development is limited by existing topography and intervening vegetation such that no significant landscape or visual impacts are predicted to occur to any of the designated landscapes identified.

With regards to predicted impacts on landscape character during the construction phase, localised temporary, adverse effects have been predicted to occur within all identified Landscape Character Areas, limited to areas of ground disturbed during the construction phase. Remaining portions of the LCA's are predicted to experience no significant effect as a result of the Proposed Development.

Of the nineteen viewpoints selected for assessment purposes, none are predicted to experience significant visual effects during the construction phase of the Proposed Development.

During the operational phase of the Proposed Development no significant landscape effects are predicted for any of the LCAs or designated landscapes assessed due to the nature of the elements of the Proposed Development and the open, expansive nature of the landscapes within which they have been placed.

Of the nineteen viewpoints selected for assessment purposes, none are predicted to experience significant visual effects during the operational phase of the Proposed Development.

Of the 213 residential properties and property clusters assessed as part of the Residential Visual Amenity Assessment, 21 individual properties and property clusters are predicted to experience a minor to moderate visual impact during the operational phase of the Proposed Development. Such impacts have been assessed as not significant as existing views from these properties are often expansive in nature and the Proposed Development is readily absorbed within the view or perceived as a minor addition to the view.

No significant visual impacts have been predicted to occur for Way marked trails such as the Ulster way, Vinegar Hill Loop or for scenic trails such as the Central Sperrins Scenic Route or for the numerous cycling trails that occur within the study area.

The assessment has considered cumulative effects, arising from the addition of the Proposed Development in combination with other proposed and potential developments within proximity. Predicted cumulative effects have been assessed as not significant.

The assessment has considered the potential for transboundary effects, arising from the Proposed Development and predicted landscape and visual effects have been assessed as not significant.

Overall, the surrounding landscape and its visual resource has the ability to accommodate the changes associated with this type of development.

6 CULTURAL HERITAGE

A desktop survey of all archaeological and cultural heritage sites within an approximately 200m wide assessment corridor centred on the proposed distribution line alignment was carried out in order to ascertain the heritage constraints and potential direct impacts therein. In addition, a further c1km wide study corridor centred on the Proposed Development was assessed in order to determine any potential indirect negative impacts of a visual nature on the cultural heritage resource, particularly Scheduled Monuments (context, setting, inter-visibility, group settings). The following is the result of the desktop survey:

- There is no recorded archaeological monument listed in the Sites and Monuments Record (SMR), Listed Buildings or Historic Parks, Gardens and Demesnes within the 200m assessment corridor centred on the proposed distribution 33kV powerline.
- There is a total of five Industrial Heritage Record (IHR) sites within the 200m proposed distribution 33kV powerline assessment corridor, three of which are directly on the alignment of underground cable routes.
- There are no Defence Heritage sites, Battle sites, Areas of Significant Archaeological Interest (ASAI) or UNESCO World Heritage Sites (Cultural) within the c1km proposed distribution 33kV powerline study corridor.
- Within the c1km proposed distribution 33kV powerline study corridor there are three (3 no.) SMRs that are designated as scheduled monuments, five Listed Building and two Historic Parks, Gardens and Demesnes sites.

The desktop survey was followed by site inspections of the Proposed Development alignment, undertaken in March, May and August 2018, October 2019 and April 2021 by a team of suitably qualified and experienced archaeologists. The initial field surveys identified a small number of potential archaeological features. Further inspections revealed that a possible mound at Rouskey (outside the 200m assessment corridor) and a stone arrangement at Tirnamaddan are of potential archaeological significance.

In summary, the Proposed Development will not result in any likely predicted significant impacts on the cultural heritage resource. All recorded and potential Cultural Heritage sites identified within the study area pertaining to the Proposed Development shall continue to be preserved *in situ*, with no direct impacts on same. The proposed OHL development will have no direct impact on the newly discovered potential archaeological features (possible mound and stone arrangement).

The Proposed Development has the potential to have an indirect (visual) impact of Slight/Moderate significance of effect on four recorded archaeological sites (three of which are scheduled); an indirect (visual) impact of potential Moderate significance of effect on a potential (unrecorded) archaeological site (stone arrangement); as well as an indirect (visual) impact of potential Not Significant/Slight significance of effect on a potential (unrecorded) archaeological site (possible mound). Potential direct impacts on three industrial heritage sites in the study area are considered Not Significant/Slight significance of effects. Potential indirect (visual) impacts on two industrial heritage sites in the study area are considered Imperceptible.

Overall, any potential direct impacts on hitherto unknown sub-surface features are deemed to be adequately mitigated by a licenced programme of archaeological monitoring (watching brief) with appropriate evaluation, recording and reporting therein.

No likely predicted significant impact is expected on the cultural heritage resource as a result of this Proposed Development.

7 TERRESTRIAL ECOLOGY AND ORNITHOLOGY

A suite of ecological surveys has been undertaken to establish the ecological baseline of the site, these included Extended Phase 1 Habitat Survey and more detailed ecological surveys for bats, marsh fritillary, badger, smooth newt, common lizard and breeding waders. It is considered that this comprehensive suite of surveys has facilitated an accurate assessment of the ecological baseline to assess against the potential impacts of the Proposed Development.

There are a number of designated sites that have the potential to be affected by the Proposed Development. These include the Owenkillew River SAC and ASSI; the River Foyle and Tributaries SAC and ASSI; the River Finn SAC in the Republic of Ireland; Owenreagh Hill Local Wildlife Site (LWS); Glenelly River LWS; and Golan Burn LWS. The route of the Proposed Development has been designed, as far as possible, to avoid designated sites. The Proposed Development has the potential to affect the water quality of designated sites where construction works are in close proximity to watercourses or at watercourse crossings. There is also potential to affect habitats during pre-construction site clearance works; construction works that will include machinery access, excavation and installation of infrastructure and also during operational maintenance works that will require the removal of vegetation to defined safety clearance distances. Extensive mitigation measures including timing of works, good practice measures, pollution prevention measures, contingency planning and method statements are set out in the oCEMP to protect watercourses.

There are a total of seven Northern Ireland Priority Habitats (NIPH) that occur along the route of the Proposed Development. These consist of wet woodland; hedgerows; rivers and streams; purple moor-grass and rush pasture; blanket bog; upland heath; and upland fens, flushes and swamps. Other habitats of local and site level ecological value include woodland, marshy grassland, semi-improved grassland, improved grassland, earth banks and scrub. The route of the Proposed Development has been designed, as far as possible, to avoid both NIPH and the loss of habitats which are considered features of natural heritage importance. There are a number of locations along the route of the Proposed Development however where pre-construction site clearance works, construction works, and operational maintenance works will have a direct impact on NIPH. Mitigation measures will include an Ecological Clerk of Works (ECoW) to supervise works, a reduction in Working Area, micro-siting to avoid sensitive areas, buffer zones, sensitive working methods and habitat reinstatement.

The invasive non-native species Japanese knotweed and Himalayan balsam are present along the route of the Proposed Development. Pre-construction site clearance, construction works, and operational maintenance works have the potential to spread these invasive species in the absence of mitigation measures. An Invasive Species Method Statement sets out the measures that will be implemented to prevent the spread these species.

The habitats along the route of the Proposed Development have potential to be used by a range of protected species. Protected species confirmed to be present include otter, marsh fritillary, badger, smooth newt, common lizard and breeding waders. Pre-construction site clearance, construction works, and operational maintenance works have the potential to have a direct and indirect impact on these species in the absence of mitigation measures. Mitigation measures include pre-construction protected species surveys, timing of works, an ECoW to supervise works, derogation licences, a reduction in Working Area, micro-siting to avoid sensitive areas, Ecological Exclusion Zones (EEZ), sensitive working practices and habitat reinstatement.

The sHRA includes Stage One Screening and Stage Two Appropriate Assessment of the implications of the Proposed Development on European sites. Screening identified likely significant effects in relation to habitat alteration for the Owenkillew River SAC and water quality and habitat deterioration for the River Finn SAC, River Foyle and Tributaries SAC, Owenkillew River SAC, Lough Foyle SPA, Lough Foyle SPA (ROI) or the qualifying criteria for Lough Foyle Ramsar site in the absence of mitigation and best practice measures intended to avoid or reduce harmful effects on those European sites. It was therefore necessary to undertake Appropriate Assessment to consider the impact of the project on the integrity of European sites with respect to their conservation objectives. The sHRA concludes no adverse effect upon the integrity of any European site will arise as a result of the Proposed Development with the application of mitigation measures, and no reasonable scientific doubt remains as to the absence of such effects.

8 FISHERIES AND AQUATIC ECOLOGY

Desk studies and field surveys were used to describe the current state of fish populations, fish habitat and the quality of the aquatic environment at streams and rivers crossed by the proposed Dalradian interconnector overhead line and underground cable in the Owenkillew and Glenmornan river catchments.

This information was then used to produce a report describing the possible impacts that the installation and operation might have on fisheries and aquatic ecology. A series of mitigations was recommended to prevent or reduce the potential impacts described.

A number of streams and rivers crossed by the underground cable route support trout, salmon and invertebrate communities that are sensitive to changes in the quality of their habitat. For the construction phase of the cable installation, the report identified the main possible impacts on streams and rivers as the release of sediment and other pollutants, noise and vibration, the removal of fish and other sensitive species, and temporary blocking of the movement of fish. For the overhead line, sediment and the release of other pollutants, were identified as the main possible impacts on watercourses.

Proposed mitigations include avoiding construction works during key periods of fish migration and spawning, careful management of water and adherence to government guidelines when working near watercourses, project design that avoids excavation in sensitive streams, and the removal and transfer of fish away from some locations until construction work is complete. When the overhead line and underground cable are in position, no impacts on streams and rivers are expected.

Full implementation of the mitigations described will ensure that no adverse impacts on fish, their habitats and that of the general aquatic environment will occur.

9 WATER QUALITY

The baseline water quality was defined through desk based assessment, field surveys and consultation with relevant statutory organisations. This Proposed Development traverses watercourses within five river water bodies and two groundwater bodies. The Glenmornan River and Dunnyboe River water bodies are within the Burn Dennet and Foyle catchments. While the Glenelly River, Owenkillew River (Gortin) and Owenreagh (East) River (Drumlea) water bodies are within the Owenkillew catchment, both catchments are part of the North Western River Basin District.

The current water quality status for the Owenkillew River (Gortin), Dunnyboe Burn and Owenreagh (East) River (Drumlea) are at 'Good' overall status and are achieving their objectives under the North Western River Basin District and Water Framework Directive (WFD), while the Glenelly River and Glenmornan River are at "Moderate" overall status and must improve to 'Good' status in order to achieve their objectives. The Proposed Development is located over the Claudy and Gortin groundwater bodies, which are currently classified as 'Good' status

The core objectives of the WFD is for all water bodies to achieve 'good status' where they are currently at less than good status and to prevent the deterioration in status. In addition WFD objectives requires that the water dependent protected areas linked to the water bodies must not be compromised. It will be a requirement that this project does not result in any deterioration of the current status of the relevant water bodies and does not prevent the improvement in status where this is required under the WFD.

A significant proportion of waters in the North Western RBD are protected under existing European Union (EU) legislation requiring special protection due to their sensitivity to pollution or their particular economic, social or environmental importance. Protected areas that are hydrologically linked to the water bodies traversed by the proposed development include the Owenkillew River SAC, Foyle and Tributaries SAC, downstream drinking water protected areas for the public water supply abstraction from the Strule River and Salmonid waters.

The key focus of the water quality impact assessment is to ensure whether the development can be undertaken in a way which is consistent with the objectives of the WFD. Therefore likely significant effects were assessed for construction, operational and potential decommissioning stages of the project with particular regard to the objectives of the WFD.

The potential construction phase impacts include suspended solids, physical changes to a water bodies (hydromorphology), oils and other chemicals, sewage and welfare facilities which were all identified as risks to water quality and the achievement of the WFD objectives. During the operational phase, there is a potential for impacts on water bodies during routine maintenance or repair works. Decommissioning is not envisaged, however should this be required, all associated structures and materials would be recovered and items recycled with the site returned to its original use. Decommissioning impacts will be the same or lesser than the impact of construction.

Proposed mitigation measures include careful management, implementation and adherence to best practice guidelines during construction, operation and decommissioning particularly when working in the vicinity of water bodies and a project design that avoids excavation in sensitive water bodies. Full implementation of the mitigations measures will ensure that no adverse impacts on the water environment will occur.

An assessment of the significance of the residual impacts for the construction, operational and decommissioning phases of the project with the implementation of the mitigation measures proposed, resulted in a residual impact considered to be negligible with no likely significant effects on the objectives of the water bodies traversed.

There are also no likely significant effects from the Proposed Development during the construction, operation or potential decommissioning phases, which would result in either positive or negative cumulative effects with other Proposed Developments on the existing water resource for the area traversed by the Proposed Development.

10 FLOOD RISK

This chapter provides a summary of the findings of the Flood Risk Assessment (FRA) which has been prepared in accordance with Revised Planning Policy Statement 15 (PPS15) 'Planning and Flood Risk' (September 2014).

The assessment considered the four main sources of flooding in PPS15. The potential for flooding was based on the published maps available from Flood Map (NI). The assessment identified that the main sources of flood risk to the development are river flooding and surface water flooding. The overhead line and underground cable cross various watercourses that are both designated and undesignated in accordance with the Drainage (NI) Order 1973. The strategic floodplain maps indicate that both the overhead line (OHL) and the underground cable (UGC) cross areas of fluvial and surface water floodplain.

Mitigation measures are required to ensure there is no increased risk of flooding as a result of the Proposed Development. The mitigation measures have been considered based on Policies FLD1-3 of PPS15. Polices FLD4 and 5 have been demonstrated not to apply to the Proposed Development.

The Strategic Flood Map indicates that the OHL and UGC cross various areas identified as floodplain (1% Annual Exceedance Probability). Due to the length of the route, and the need for fixed start and end points, it is not possible to avoid all floodplains. Careful consideration has been given to the construction methodologies to minimise the impact on watercourses and floodplains. The proposed alignment has been changed wherever possible, considering all other factors, so that wooden poles of the overhead line avoid the floodplain identified from the published flood maps. Where possible, the poles are being set back at least 10m from any watercourse, which will help to avoid any floodplains. Where a pole has to be located within the floodplain, the impact of increasing flood risk is considered negligible since the footprint of the poles on the ground will be insignificant in relation to the floodplain area. The poles themselves will not be affected by the floodwater as they are mechanically fit for purpose for a range of climatic conditions. The OHL is raised well above flood levels so there will be no risk to this from flooding. The Proposed Development is therefore compliant with Policy FLD1.

Policy FLD2 does not permit development that would impede the operational effectiveness of flood defence and drainage infrastructure or hinder access to enable their maintenance. Where a new development is located beside a watercourse it is essential that an adjacent working strip is retained to facilitate future maintenance by DfI Rivers, other statutory undertaker or the riparian landowners. The working strip should have a width of 5-10m, and be provided with clear access and egress at all times. All poles will be set back at least 10m from any watercourse, where possible. There are eight locations where poles are less than 10m from the watercourse. Five of these are less than 5m from the watercourse, however single poles will not cause a barrier to any maintenance activities. The Proposed Development is therefore compliant with Policy FLD2.

The Proposed Development does not exceed any of the thresholds in Policy FLD3 for a Drainage Assessment to be required. This was confirmed in the DfI Rivers consultation response. Under Policy FLD3, where a Drainage Assessment is not required but there is the potential for surface water flooding, it is the developer's responsibility to assess the flood risk and drainage impact and to mitigate the risk to the development and any impacts beyond the site. Both the OHL and UGC cross areas identified as surface water floodplain. The OHL is raised well above any potential surface water flooding. The small footprint of the poles will cause a negligible increase in surface water flood risk. The Proposed Development will not create any new hardstanding, so there will no surface water runoff generated that could cause a flood risk. The Proposed Development is therefore compliant with Policy FLD3.

The Proposed Development has been shown to be compliant with all policies of PPS15. In accordance with PPS15, a Flood Risk Assessment has been prepared which demonstrated that:

a) all sources of flood risk to and from the Proposed Development have been identified;

b) there are adequate measures to manage and mitigate any increase in flood risk arising from the Proposed Development. These include avoidance of the floodplain, where possible, for development and setting of all poles back at least 10m from any watercourse, where possible;

The significance of the impact of the Proposed Development on flood risk is 'Minor'.

11 POPULATION AND HUMAN HEALTH

The proposed electricity distribution infrastructure will comprise c26.9 km of 33 kV overhead line (OHL) and c11 km of 33 kV underground cabling (UGC) that will generate electric and magnetic fields (EMFs). EMFs are part of the natural world, and are also produced wherever electricity is generated, transmitted or used. Public exposure to power-frequency EMFs comes from a range of sources including household wiring and appliances, low-voltage distribution power lines or underground cables, and high-voltage transmission power lines or underground cables.

It is possible for strong power-frequency EMFs to have a detectible physiological effect on the body. Very extensive scientific research has been undertaken to investigate whether there is potential for adverse health effects from EMFs exposure. International and national health protection bodies have reviewed this data using a weight of evidence approach and have recommended conservative guidelines for public EMFs exposure, set to protect health.

Guidelines have been published by ICNIRP. They form the basis of an EC Recommendation and have been adopted in the UK, on the basis of advice from the government's scientific health advisors, in the form of a Code of Practice agreed with the electricity industry. This specifies reference levels that should not be exceeded in order to ensure public health protection.

The public health protection guideline reference level specified in the Code of Practice for magnetic field exposure is 360 μT (microteslas). For electric field exposure it is 9 $kV.m^{-1}$ (kilovolts per meter).

The Code of Practice states that compliance with the public exposure guidelines set to protect health may be assumed for all OHLs, underground cables and substations operated at 132 kV or less, without the need for more detailed assessment, on the basis of evidence published by the Energy Networks Association (ENA) showing that by design such infrastructure is not capable of causing exceedance of the public exposure guideline limits.

The ENA's statement of exposure guideline compliance is for large dual-circuit 132 kV OHLs. It states that the maximum magnetic field strength, calculated for 'worst case' conditions (i.e. with maximum load, minimum height clearance and untransposed phasing), is 40 μT, well below (11% of) the Code of Practice 360 μT public exposure guideline limit set to protect health. The maximum calculated electric field strength is 3.6 $kV.m^{-1}$, well below (40% of) the Code of Practice 9 $kV.m^{-1}$ public exposure guideline limit set to protect health. Electric and magnetic field strength from lower-voltage OHLs and UGCs associated with the proposed transmission infrastructure would be lower than these maxima.

The Proposed Development is for a smaller single-circuit OHL, operating at 33 kV. Further evidence of electric and magnetic field strengths published by the ENA for smaller 33 kV power lines indicates that typical field strengths would be significantly lower: a maximum of 0.9 $kV.m^{-1}$ and 25.7 μT underneath the OHL, with field strength further decreasing rapidly with distance away from the OHL. This is therefore compliant with the 1998 ICNIRP guidelines, as required by the SPPS for Northern Ireland.

Concerning the associated 33 kV underground cable connections, the cable sheath and fill material above the cables shields the electric field, with no measurable electric field strength expected above ground level. Magnetic field strengths from 33 kV underground cables are stated in the Code of Practice to be among the types of equipment that by design are not capable of exceeding the public exposure guidelines. Furthermore, an assessment undertaken using the specific UGC design specifications shows that the maximum magnetic field produced by the cable would be 1.82 μT, which would occur at ground level directly above the centreline. This is well below (0.5% of) the Code of Practice 360 μT public exposure guideline limit set to protect health and therefore also compliant with the 1998 ICNIRP guidelines, as required by the SPPS for Northern Ireland.

In conclusion, on the basis of the guidance for EMFs from electricity infrastructure adopted in the UK and the published evidence to support that, it is considered that the levels of power-frequency EMFs from the OHLs and UGCs of the proposed transmission infrastructure would be well below the guideline public exposure reference levels set to protect health. As such, the magnitude of impact would be negligible, with no identifiable health effects even taking a precautionary approach of assuming uniformly high sensitivity across the entire population.

12 AIR QUALITY

This chapter of the ES assesses the likely significant effects of the Proposed Development on the environment in respect of Air Quality. This chapter sets out the relevant air quality management policy and legislative context, and details the methodology and significance criteria used in the assessment. It then describes the existing and predicted future air quality conditions, the likely effect of the Proposed Development on local air quality, and any mitigation required. It concludes with an assessment of the residual and cumulative effects with respect to local air quality.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equality issues, because areas with poor air quality are often less affluent areas. The air quality standards and objectives are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence. These are general concentration limits, above which sensitive members of the public might experience adverse health effects.

Atmospheric pollution in the vicinity of the Proposed Development is largely dominated by road traffic exhaust fumes, with potential contributions from residential heating emissions and to a lesser extent agricultural practices. Vehicular transport sources account for a large proportion of the emissions of several air pollutants, although most of the pollutants emitted by road vehicles are also produced by a wide range of industrial, commercial and domestic processes.

For the construction phase, an important consideration is dust. Without appropriate mitigation, dust can cause temporary soiling of surfaces, transportation of dust to areas outside the subject site and impact on sensitive receptors. Without appropriate mitigation or monitoring measures, nuisance dust can cause soiling of surfaces.

During the construction phase there will be associated air quality and dust emissions to the atmosphere. Mitigation measures are needed to reduce the potential for significant effects of dust emissions in the vicinity of the Proposed Development. In order to avoid significant impacts from atmospheric emissions during the construction phase, the mitigation will be delivered through compliance with an outline dust and emissions management plan.

The principal activities that have the potential to result in fugitive emissions of dust from site construction works are pole erection excavations, rock breaking, excavation and stockpiling for the underground cable and track out from vehicles. Dust can be spread onto the public highway and along public access paths by vehicles entering and exiting the site.

There are no significant increases in traffic associated with the Proposed Development and as such the operational phase emissions can be screened out of the assessment. For this Proposed Development, as set out in this chapter the operational phase impacts are determined as being “not significant”.

The Proposed Development does not, in air quality terms, conflict with national or local policies. There are no constraints to the Proposed Development in the context of air quality.

13 CLIMATE AND GREENHOUSE GASES

This chapter of the ES provides the relevant legislative and policy context, an overview of the assessment methodology, baseline climate data, incorporated mitigation and additional mitigation measures in relation to climate and greenhouse gases (GHG). The effective assessment and management of impacts on climate, as well as the effects of climate change on projects provides the opportunity to:

- improve the resilience of projects to future climate conditions, such as increased risk and severity of flooding, drought, heatwaves, intense rainfall events and other extreme weather events; and,
- reduce the impact of projects on climate by minimising the magnitude of GHG emissions as far as possible.

Climate change in the context of Environmental Impact Assessment (EIA) can be considered broadly in two domains: the impact of greenhouse gases (GHGs) caused directly or indirectly by the Proposed Development, which contribute to climate change; and the potential impact of changes in climate to the development, which could affect it directly or could modify its other environmental impacts.

'Climate' is generally understood to mean the weather conditions prevailing over a long period of time and climate change refers to changes in recorded long term climate trends. As a topic for the assessment within EIA, climate change is relatively new. Guidance is evolving and there is no prescribed way in which climate change should be incorporated into an ES, however, some guidance has been prepared by IEMA, discussed further below, which sets out the two main approaches that can be taken to determine a project's climate change impact.

These involve identifying:

- The vulnerability of the Proposed Development to climate change; and
- The direct and indirect influence on the Proposed Development on climate change.

The vulnerability of the Proposed Development to climate change considers effects on the Proposed Development as a receptor (this is referred to in IEMA Guidance as Climate Change Resilience and Adaptation). A climate change risk and resilience assessment has been undertaken to identify the potential risks of climate change on the Proposed Development and to high design measures to increase its resilience and adaptation to climate hazards, such as extreme hot and cold weather, intense rainfall, high winds and storm events.

Construction and operation of the Proposed Development is likely to result in emissions of GHGSs from direct sources and indirect sources. It is not anticipated that the scale of projected climate change identified will fundamentally alter baseline conditions or the effects included in the ES. No significant adverse effect on the Proposed Development due to climate change during operation is predicted. No mitigation measures are therefore suggested.

14 NOISE AND VIBRATION

This chapter of the ES assesses the Noise and Vibration impact of the Proposed Development. The noise impact assessment assesses the likely significant impacts from the construction activities of the Proposed Development on the nearest noise sensitive receptors. The effect of construction noise has been assessed in full. The construction noise targets are set out along with the assessment methodology and results of the construction noise predictions and calculations. Noise mitigation measures are discussed such that noise targets are met throughout the construction phases.

The specific objectives of the noise and vibration assessment are to:

- define the assessment methodology and significance criteria used in completing the noise and vibration impact assessment;
- describe the likely significant effects, including indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development,
- describe the mitigation measures proposed to address the likely significant effects; and
- assess the residual effects remaining following the implementation of mitigation.

On the basis of the desk-based work undertaken and professional judgement of the author the following areas have been scoped out of the detailed assessment including:

- Construction vibration as the proposed construction activities do not include piling;
- Operational noise has not been included as there is no inclusion of new significant noise sources likely to generate perceptible noise levels when the Proposed Development is operational including the overhead lines or the underground cables;
- Operational vibration has not been included as there is no inclusion of new significant vibration sources likely to generate perceptible levels of vibration when the Proposed Development is operational.

The local noise climate of the Proposed Development is considered likely to comprise of; distant road traffic, local road traffic, natural noise sources (e.g. birds, wind in trees etc.) and agricultural activity. The prevailing noise levels are, therefore, considered to be predominantly low both for ambient and background noise.

In order to identify the potential construction noise and vibration impacts upon construction noise receptors 320m either side of the Proposed Development defined as noise and vibration study area. A construction noise assessment has been performed according to the method and guidance provided in BS 5228[3]. Construction noise levels have been predicted from proposed construction activities associated with overhead line and underground cable.

No permanent residual noise and vibration impacts are predicted during construction of the Proposed Development. However, some short term residual impacts during the construction stage of the Proposed Development are predicted. No significant impacts are predicted.

[3] British Standard BS5228: 2009+A1:2014, Code of Practice of Noise and Vibration Control on Construction and Open Sites Part 1: Noise

15 TRAFFIC

This chapter details the likely effects of the construction and operational traffic generations associated with the introduction of the Proposed Development on the surrounding highway network.

Traffic surveys were undertaken in 2021 on the surrounding road network to determine the existing baseline traffic volumes. It is noted that a number of cameras used to gather traffic data were unlawfully removed by persons unknown.

The construction phase has been considered and it is predicted that in terms of volume of traffic this will have an insignificant impact upon the surrounding highway network.

However, during construction there is the potential for short term road closures on some sections of the underground cabling route, although any B-road closures (local access and emergency access will be retained at all times) will be restricted to 0900-1600 hours, outside of these hours the road will be open for all vehicles.

These potential road closures and predicted diversion routes have been assessed within the chapter. The impact of potential road closures has been and it has been predicted that the impact, should this occur, would be moderate adverse, but short term in respect of the increased traffic on the diversion route.

The operational phase has also been considered within the chapter. The operational phase is associated with maintenance and therefore infrequent low levels of trips which will have an insignificant impact upon surrounding highway network.

There is no anticipated mitigation works associated with this Proposed Development as existing accesses will be used.

The chapter also considers the cumulative impact of other significant traffic generators which may be in construction during similar programmes of delivery. It is considered that the cumulative impact will not result in a significant impact upon the surrounding highway network.

16 WASTE MANAGEMENT

The likely significant effects of the Proposed Development, in terms of the potential waste streams generated during construction, the quantities of waste that will be produced and the proposed management routes have been assessed. While decommissioning is not envisaged, the potential impacts of decommissioning of the Overhead line (OHL) and underground cable (UGC) have also been considered.

Effects from the forecast waste generation have been assessed in the context of the effects on regional waste management landfill infrastructure capacity, legislation, policy and strategy targets. Mitigation measures are proposed to reduce the impact of waste generated by the proposed development.

The excavation for erection of the OHL will produce a small footprint and the material will reused as backfill during the installation of the wooden poles for the overhead section of the Proposed Development. For the UGC section, the trench excavations are likely to give rise to, as the worst-case scenario, 13,860 tonnes of excavated materials to be removed off-site for disposal. Once operational, the overhead line will become a network asset and form part of the wider network. The Proposed Development has no likely effects in relation to waste management during its operation.

Contractors working on the site during the works will be responsible for the collection, control and disposal of all wastes generated by the works and the contractor will meet all legal requirements. All wastes will be managed offsite within Northern Ireland under the principles of the waste management hierarchy by reuse, recycling, recovery and disposal to inert, non-hazardous facilities, as appropriate. There is available capacity within the existing waste management infrastructure to manage CDW from the proposed development works.

Decommissioning of the underground cable is not envisaged, however should the UGC be required to be decommissioned, it would be disconnected from the circuit breakers or poles to which it is connected, safely insulated using pot end joints and the cable will be recovered for recycling. As a result, the impact of decommissioning the UGC would be significantly less that than the impact of installation.

By implementing mitigation measures and by managing wastes in accordance with the waste management hierarchy and best practice guidance, the wastes generated during the construction phase of the proposed development will have no adverse effect on waste management in the area. It is concluded that the significance of the Proposed Development in relation to waste management is Not Significant.

17 MAJOR ACCIDENTS AND DISASTERS

This chapter provides consideration and assessment of expected significant adverse effects of the Proposed Development on the environment deriving from the vulnerability of the Proposed Development to risks of either relevant major accidents and/or disasters.

Based on professional judgement, major accidents or disasters are events or situations that have the potential to affect the Proposed Development causing immediate or delayed serious damage to one or more of the following human health, welfare, and the environment. This assessment considers the risks of major accidents and disasters (hereafter referred to as major events) during construction and operation caused by natural hazards or manmade hazards (including operational failure).

In the context of this chapter, major events are events which rarely occur due to the mitigation, management or regulatory controls implemented to prevent them. By definition, if a major event were to occur the likely worst case would always be a major adverse effect.

Given the embedded mitigation and management procedures it is considered that the likely risks associated with risk events occurring will be managed. Additionally, given baseline conditions within the study area and embedded mitigation the Proposed Development's vulnerability to major accidents and disasters is not considered to be high and thus significant effects are not considerable to be probable.

There needs to be a general acceptance when conducting a major accidents and/or disasters assessment that some risks, however unlikely, may still occur. Mitigation is therefore identified pre-event and post-event to reduce the effects to an acceptable level. For those risks that cannot be completely designed-out, emergency plans are available to deal with the response in order to minimise the significance of any impacts.

Accordingly, it is considered that there will not be any likely significant environmental effects arising from the vulnerability of the Proposed Development to major accidents and natural disasters.

18 INTERACTIONS

Regulation 5(2) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 requires that the EIA identifies, describes and assesses in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following factors—

(a) population and human health;

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape; and

(e) the interaction between the factors referred to in sub-paragraphs (a) to (d).

Table 18.1 below is a matrix table indicating the significant inter-relationships, interactions and in combination effects that are likely to occur between the various environmental disciplines with regard to the proposed redevelopment. Where a tick exists in a box in the table, this indicates that a relationship exists between the two environmental areas.

The purpose of the table is to allow interaction between various disciplines to be recognised, although the level of interaction and in-combination effect will vary in each case. It is assumed in presenting this table that an environmental discipline has a potential inter-relationship both during the construction and operational phases of the redevelopment.

Table 18.1: Inter-relationship Matrix – Potential Interaction Between Environmental Factors

Chapter	Landscape and Visual	Cultural Heritage	Terrestrial Ecology and Ornithology	Fisheries and Aquatic Ecology	Water Quality	Flood Risk	Population and Human Health	Air Quality	Climate and Greenhouse Gases	Noise and Vibration	Traffic	Waste	Major Accidents and Disasters
Landscape and Visual		✓					✓						
Cultural Heritage	✓												
Terrestrial Ecology and Ornithology				✓	✓	✓				✓	✓	✓	✓
Fisheries and Aquatic Ecology			✓		✓	✓						✓	✓
Water Quality			✓	✓		✓	✓					✓	✓
Flood Risk			✓	✓	✓				✓				
Population and Human Health	✓				✓			✓	✓	✓	✓	✓	✓
Air Quality							✓		✓		✓		
Climate and Greenhouse Gases						✓	✓	✓			✓		✓
Noise and Vibration			✓				✓				✓		
Traffic			✓				✓	✓	✓	✓		✓	✓
Waste			✓	✓	✓		✓				✓		
Major Accidents and Disasters			✓	✓	✓		✓		✓		✓		

The assessment chapters in the ES contain assessments of the likely significant interacting effects arising from the Proposed Development within the context of the overall Curraghinalt Mine project. During the assessment process, coordination took place between assessment specialists to ensure that interacting impacts arising from the Proposed Development were identified, assessed and, where appropriate, mitigated.

While there is potential for the impacts described to interact, it is unlikely as a result of the mitigation measures proposed, that any of these interactions will result in significant additional impacts that are not already anticipated by each environmental topic.