

Denny to Wishaw Network Upgrade

Environmental Impact Assessment Report

Volume 3 Appendices

Appendix 2.2 Scoping Report

May 2026



Prepared for:

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Appendix 2.2

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List of Acronyms

Term	Definition
AADT	Annual Average Daily Traffic
AIL	Abnormal Indivisible Loads
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BGN	Background Noise Assessment
BGS	British Geological Survey
BNG	Biodiversity Net Gain
BoCC	Birds of Conservation Concern
BSI	British Standards Institution
CAFE	The Clean Air for Europe programme
CCC	Climate Change Committee
CCRA	Climate Change Resilience Assessment
CH ₄	Methane
CIEEM	Chartered Institute of Ecology and Environmental Management
ClfA	Chartered Institute for Archaeologists
CIHT	The Chartered Institution of Highways and Transportation
CMRA	Coal Mining Reporting Area
CNMP	Construction Noise Management Plan

Term	Definition
CO	Carbon Monoxide
COMAH	Control of Major Accident Hazards
COP	Conference of Parties
CO ₂	Carbon Dioxide
CRF	Congestion Reference Flow
CSM	Conceptual Site Model
DBW	Daytime Bat Walkover
DESNZ	Department for Energy Security and Net Zero
DHRA	Development High Risk Area
DMRB	Design Manual for Roads and Bridges
DfT	Department for Transport
DTM	Digital Terrain Model
EcIA	Ecological Impact Assessment
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electric and magnetic Field
EULV	EU Limit Values
EU	European Union
FC	Falkirk Council
FLDP	Falkirk Local Development Plan
FRA	Flood Risk Assessment
GCN	Great Crested Newt
GHG	Greenhouse Gas

Term	Definition
GHz	Gigahertz
GLTA	Ground Level Tree Assessments
GLVIA	Guidelines for Landscape and Visual Impact
GSP	Grid Supply Point
GVA	Gross Value Added
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HDV	Heavy Duty Vehicle
HEPS	Historic Environment Policy for Scotland
HES	Historic Environment Scotland
HFC	Hydrofluorocarbon
HGV	Heavy Goods Vehicle
HND	Holistic Network Design
HRA	Habitats Regulations Appraisal
HSI	Habitat Suitability Index
IAQM	The Institute of Air Quality Management
ICCI	In-combination Climate Change Impact
ICE	Inventory of Carbon and Energy
IEMA	Institute of Environmental Management and Assessment
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
ISO	International Organisation for Standardisation
KGV	King George V Dock Glasgow
km	kilometre

Term	Definition
kV	Kilovolt
LAQM	Local Air Quality Management
LB	Listed Building
LCA	Landscape Capability for Agriculture
LCRM	Land Contamination Risk Management
LCT	Landscape Character Type
LDP	Local Development Plan
LDV	Light Duty Vehicle
LEPO	Long-established Woodland of Plantation Origin
LGV	Light Goods Vehicle
LNR	Local Nature Reserve
LOS	Level of Service
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact
MPH	Miles per Hour
MRA	Mining Remediation Authority
MTCO ₂ e	Million Tonnes of Carbon Dioxide equivalent
NESO	National Energy System Operator
NF ₃	Nitrogen Trifluoride
NFI	National Forest Inventory
NGESO	National Grid Electricity System Operator
NGET	National Grid Electricity Transmission
NGR	National Grid Reference
NLC	North Lanarkshire Council

Term	Definition
NLDP	North Lanarkshire Development Plan
NLS	National Library of Scotland
NMPi	National Marine Plan interactive
NOA	Network Options Assessment
N ₂ O	Nitrous Oxide
NO ₂	Nitrogen Dioxide
NPF	National Planning Framework
NPF4	National Planning Framework 4
NPS	National Policy Statement
NRFA	National River Flow Archive
NRMM	Non-Road Mobile Machinery
NSR	Noise Sensitive Receptors
NVC	National Vegetation Classification
NWSS	Native Woodland Survey of Scotland
OEP	Office for Environmental Protection
OHL	Overhead Line
OS	Ordnance Survey
PAH	Polycyclic Aromatic Hydrocarbons
PAN	Planning Advice Notice
PAS	Publicly Available Standard
PCB	Polychlorinated biphenyl
PFC	Perfluorocarbon
PM	Particulate Matter
PoE	Port of Entry

Term	Definition
PPC	Pollution Prevention Control
PPG	Planning Practice Guidance
PRF	Potential Roost Feature
PRoW	Public Right of Way
PWS	Private Water Supplies
RBMP	River Basin Management Plan
RCP	Representative Concentration Pathway
RICS	Royal Institute of Chartered Surveyors
RPG	Registered Parks and Gardens
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SF ₆	Sulphur Hexafluoride
SIMD	Scottish Index of Multiple Deprivation
SINC	Site of Importance for Nature Conservation
SLA	Special Landscape Area
SM	Scheduled Monument
SO ₂	Sulphur Dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
TAN	Technical Advice Note
tCO ₂ e	Tonnes of Carbon Dioxide equivalent
TO	Transmission Owner

Term	Definition
UKCP	UK Climate Projections
UNDRR	United Nations Office for Disaster Risk Reduction
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WCA	Wildlife and Country Act
WFD	Water Framework Directive
WHO	World Health Organisation
WHS	World Heritage Site
WPZ	Water Protection Zone
WS	Wildlife Sites
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

01.

Introduction

1. Introduction

1.1 Introduction

This Scoping Report has been prepared by AECOM on behalf of SP Energy Networks¹ (SPEN, (hereafter also referred to as ‘the Applicant’)) as part of the development of proposals to reinforce the electricity transmission system in central Scotland. The proposals (collectively referred to as the ‘Denny to Wishaw Network Upgrade’ or ‘the Project’) comprise multiple components including increasing the operating voltage of existing overhead lines (referred to as ‘uprating’) from 275 to 400 kilovolts (kV), the construction of a new 400kV overhead line as well as upgrades to existing substations. In summary, the Project comprises the following components:

- The uprating of approximately 4 kilometres (km) an existing overhead line (known as ‘ZG route’) between Denny North Substation and Bonnybridge Substation from 275 to 400kV,
- The construction of approximately 20km of new 400kV overhead line between Bonnybridge Substation and an existing overhead line (known as ‘XX route’) north of Glenmavis,
- The removal of approximately 11km of an existing 132kV overhead line (known as ‘CB route’) between Bonnybridge and Cumbernauld Substation,
- Undergrounding of two sections of an existing 132kV overhead line (known as ‘AA route’) between Bonnybridge and Bathgate, where it is crossed by the proposed new overhead line,
- The uprating of approximately 15km of an existing overhead line (known as ‘XX route’) between Easterhouse and Newarthill Substations from 275 to 400kV,
- The uprating of approximately 16km of an existing overhead line (known ‘XR route’) between Newarthill and Wishaw Substations from 275 to 400kV, and
- Works at the existing Denny North, Bonnybridge, Cumbernauld, Easterhouse and Wishaw Substations to facilitate the above overhead line works.

Within this Scoping Report those existing overhead lines to be uprated are collectively referred to as the ‘Uprated Overhead Lines’ and the new overhead line referred to as the ‘New-build Overhead Line’. A plan illustrating the location of the Project is contained in Figure 1-1.

1.2 EIA and Consenting Requirements

The Applicant intends to submit four separate applications to the Scottish Ministers for consent under section 37 of the Electricity Act 1989 for each of the Uprated Overhead Lines

¹ SP Energy Networks (SPEN) is the trading name for Scottish Power Energy Network Holdings Limited. SPEN owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly-owned subsidiaries SP Transmission plc and SP Distribution plc. These businesses are ‘asset-owner companies’ holding the regulated assets and Electricity Transmission and Distribution Licenses. SP Transmission plc is the transmission licensee.

as well as the New-build Overhead Line. At the same time the Applicant will also apply to the Scottish Ministers for deemed planning permission under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 for the Up-rated Overhead Lines, New-build Overhead Line and ancillary development including works at the substations.

It should be noted that following scoping there is the option for the substation works to be progressed as five separate planning applications to the relevant Local Planning Authorities (LPAs) under the Town and Country Planning (Scotland) Act 1997. The New-build and Up-rated OHLs are considered to be 'national development' under National Planning Framework 4 (NPF4) as '(3) Strategic Renewable Electricity Generation and Transmission Infrastructure'. Should this approach be taken the applications would be progressed as national developments to reflect their status in NPF4.

The relevant Environmental Impact Assessment (EIA) regulations for applications made under the Electricity Act 1989 are the Electricity Works (EIA) (Scotland) Regulations 2017 (hereafter referred to as the 'Electricity Works EIA Regulations'). Should the substation works be progressed under the Town and Country Planning (Scotland) Act, the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as the 'TCP EIA Regulations') would apply. In relation to the main components of the Project:

- The New-build Overhead Line requires the construction of a new overhead line route and therefore is 'Schedule 1 Development' under Schedule 1(3) of the Electricity Works EIA Regulations as it comprises construction of overhead electrical power lines with a voltage of 220kV or more and a length of more than 15 kilometres (km). EIA is a mandatory requirement for Schedule 1 Development.
- The Up-rated Overhead Lines require new conductors ('wires') and insulators to be fitted to the existing towers. The Up-rated Overhead Lines are considered to be 'Schedule 2 Development' under Schedule 2(2) of the Electricity Works EIA Regulations, as they involve the carrying out of development and a change to an electric line installed above ground with a voltage of 132kV or more. EIA may be required for Schedule 2 Development having regard to the criteria Schedule 3.
- Works at Denny North, Bonnybridge, Cumbernauld, Easterhouse and Wishaw Substations to facilitate the above overhead line works. The substation works in their own right are not EIA development under Schedule 1 or 2 of either the Electricity Works EIA Regulations or the TCP EIA Regulations. However, due to their inter-relationship with the New-build and Up-rated Overhead Lines and taking account of their statutory duties, the Applicant considers it appropriate that they be subject to proportionate EIA. It should be noted that in the event the substation works are progressed as separate applications under the Town and Country Planning (Scotland) Act 1997, they would still be subject to EIA as if progressed under the Electricity Act 1989.

The Applicant proposes to prepare a single EIA Report (EIAR) for the New-build Overhead Line and Up-rated Overhead Lines which will accompany separate applications for section 37 consent for each overhead line with the scope of the assessments reflecting the difference in likely significant effects on the environment between up-rated and the new overhead line. As such, this Scoping Report accompanies a formal request for a Scoping Opinion from the

Scottish Ministers pursuant to Regulation 12 of the EIA Regulations regarding the scope of and approach to EIA of the Project. In adopting their Scoping Opinion, the Scottish Ministers are required to consult with the relevant LPAs and consultation bodies in line with the EIA Regulations. As noted above should the substations be progressed as separate applications under the Town and Country Planning (Scotland) Act 1997 then they will be accompanied by separate EIARs. These would be proportionate to and reflect the difference in likely significant effects arising from each of the proposed substation works as well as take account of relevant feedback which accompanies the Scoping Opinion.

1.3 The Applicant

As the holder of a transmission licence under the Electricity Act 1989, SP Transmission is subject to a number of statutory duties and licence obligations. These include requirements “to develop and maintain an efficient, coordinated and economical system of electricity transmission” and “to facilitate competition in the generation and supply of electricity”. This requires SP Transmission to provide for new electricity generators such as wind farm developers wishing to connect to the transmission system in its licence area; to make its transmission system available for these purposes and to ensure that the transmission system is fit for purpose through appropriate reinforcements to accommodate the contracted capacity.

In addition, in formulating proposals for electricity transmission infrastructure, SP Transmission is subject to duties under Schedule 9 of the Electricity Act: “(a) to have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and, (b) to do what it reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.”

SPEN, acting on behalf of SP Transmission, is developing proposals for the Denny to Wishaw Network Upgrade. This work is undertaken in accordance with SP Transmission’s statutory duties and licence obligations under the Electricity Act 1989 as outlined above.

1.4 Background and Need for the Proposed Development

The UK and Scottish Governments have set legally binding targets to reach net zero in greenhouse gas emissions and end their contributions to climate change by 2050 and 2045 in the Climate Change Act 2008 and Climate Change (Scotland) Act 2009 respectively. Decarbonisation of the energy sector is a central pillar of both governments’ net zero strategies meaning the way in which energy is generated, transported and used is undergoing transformational change. Traditional fossil fuel-based forms of generation are being retired and replaced by renewable and low carbon sources of energy generation including onshore and offshore wind as well as being supported by increased interconnection with Europe.

To facilitate renewable forms of generation supported by UK and Scottish Government policy and targets for offshore and onshore wind, new electricity transmission network infrastructure is needed to ensure that energy can be transported from where it is generated to where it is used. Traditionally the electricity transmission system was developed to transport electricity in bulk from power stations to cities and towns where it is transported

via the electricity distribution network, but as renewable energy sources such as onshore and offshore wind are typically located in more geographically remote locations this requires new electricity network infrastructure both to connect it to the network as well as to transport it to areas of demand.

SP Transmission, the Transmission Owner (TO) and Licence Holder responsible for the electricity transmission network in central and southern Scotland therefore has a crucial role to play. Its transmission network enables the bulk transfer of renewable energy generated within its licence area as well as that generated within SSEN Transmission's (SSENT) licence area to the north. This allows electricity to be transmitted and distributed within central and southern Scotland and also for it to be transported southwards to National Grid Electricity Transmission's (NGET) licence area and large centres of demand.

National Grid Electricity System Operator (NGESO), now known as National Energy System Operator (NESO), is responsible for the planning and operation of high voltage electricity transmission system across Great Britain. They undertake a number of activities on an annual basis to ensure the economic and efficient operation of the electricity transmission system. This includes the Network Options Assessment (NOA), an economic assessment of projects proposed by TOs including SP Transmission to provide network capacity and meet the future needs of the electricity transmission network. The analysis in NOA allows recommendations to be made as to which projects will be economic and efficient to develop and the optimal timing of those projects.

The Project, identified as DWNO, was given a 'proceed' signal meaning that it was considered appropriate to be taken forward, in successive NOA publications in 2019/20², 2020/21³ and 2021/22⁴ as well as the NOA Refresh published in 2022⁵ in parallel with the publication of the Holistic Network Design (HND). The latter which set out a blueprint for the electricity network upgrades required to enable connection of offshore wind needed to meet the Government's 2030 targets (also referred to as the 'Pathway to 2030'), also recommended the development of 'DWNO'. The recommendations in NOA highlight the need for the Project to be developed in order to ensure an economic and efficient electricity transmission system and to support meeting UK and Scottish Government targets regarding climate change.

1.5 This Scoping Report

The objective of this Scoping Report is to identify the proposed scope of and approach to the EIA of the Project i.e. those aspects of the environment that could be affected by the Project and how those effects will be identified and assessed. The structure of this Scoping Report is set out below in Table 1-1 and takes account of Regulation 12(2) of the Electricity Works EIA Regulations which sets out the information which must accompany a request for a Scoping Opinion including a description of the location, nature and purpose of the development and a description of its likely significant effects on the environment.

² Network Options Assessment (January 2020), NGESO <https://www.neso.energy/document/162356/download>

³ Network Options Assessment (January 2021), NGESO <https://www.neso.energy/document/185881/download>

⁴ Network Options Assessment (January 2022), NGESO <https://www.neso.energy/document/233081/download>

⁵ Network Options Assessment Refresh (July 2022), NGESO <https://www.neso.energy/document/262981/download>

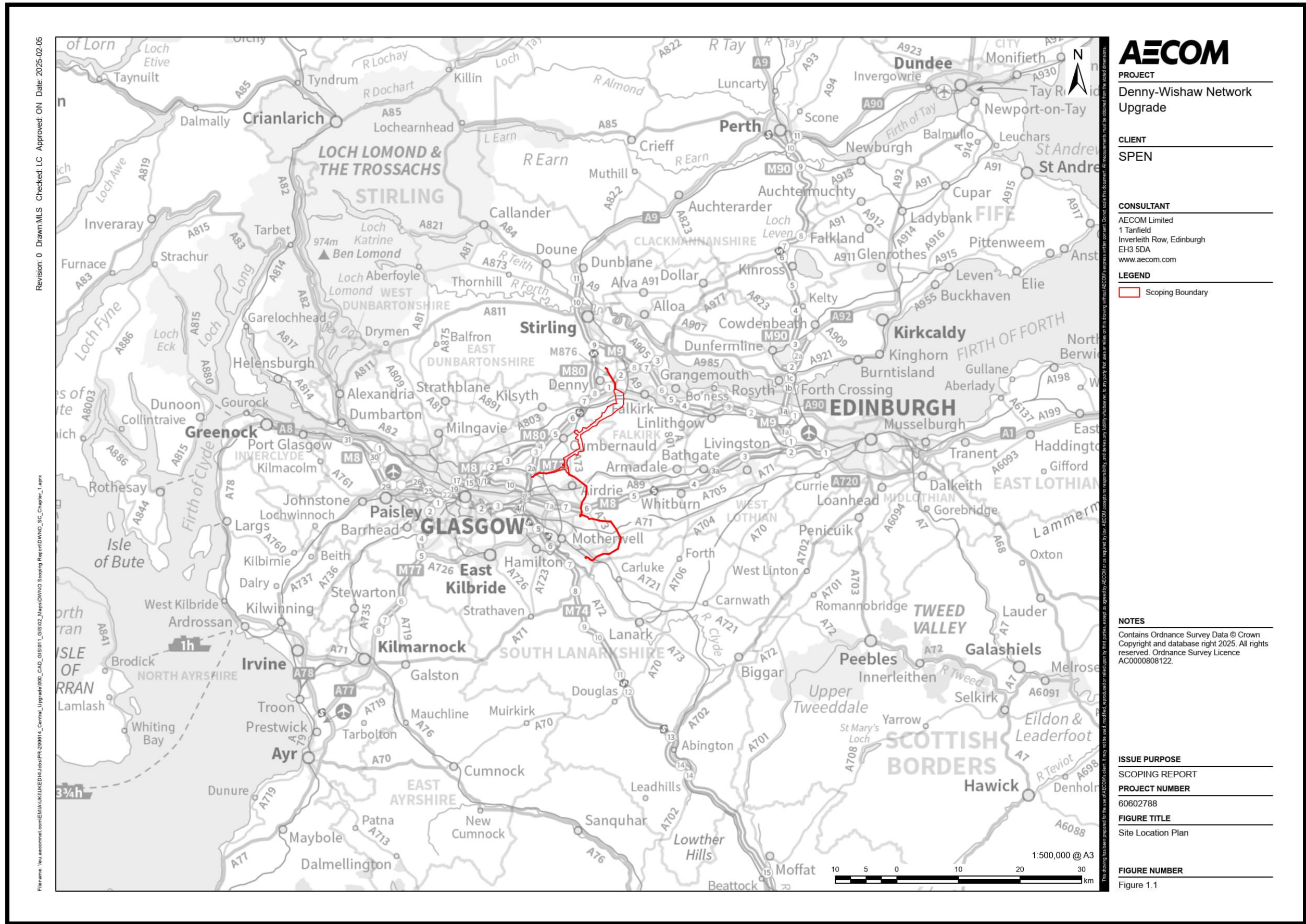
Scoping forms a key stage of the EIA process, providing a framework for identifying the aspects of the environment which could experience likely significant effects from the construction, operation or decommissioning of the Project and which should be considered within the EIAR.

Table 1-1 Scoping Report – Structure and Content

Chapter	Description of Content
1. Introduction	This chapter provides an introduction to the Project and sets out background information relating to why it is needed. It also sets out the legislative context of the Project and the Scoping Opinion request.
2. Project Description	This chapter provides a description of the three main components of the Project: the new-build overhead line between Bonnybridge and Glenmavis, the uprated overhead lines and related substation works.
3. Approach to EIA	This chapter sets out the legislative context in relation to the relevant EIA Regulations and describes the general approach to and terminology to be used in the EIA of the Project.
4. Planning Policy Context	This chapter provides an overview of relevant national and local policy in relation to energy and planning aspects which are considered to be relevant to the Project.
5. Landscape and Visual	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
6. Cultural Heritage and Archaeology	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
7. Biodiversity	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
8. Water Environment	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
9. Ground Conditions	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.

Chapter	Description of Content
10. Traffic and Transport	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
11. Noise and Vibration	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
12. Socio-economics and Recreation	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
13. Forestry, Land Use and Agriculture	This chapter provides a preliminary overview of the baseline conditions and sets out the scope of and approach to the identification and assessment of likely significant effects.
14. Other Matters	This chapter encompasses other environmental aspects which are proposed to be scoped out of the EIA and sets out the rationale for this. This includes Human Health, Climate Change and Air Quality.
15. Summary of Proposed EIA Scope	This chapter provides a summary of the proposed scope of the EIA having regard to the components of the Project as well as the structure of the EIAR.

Figure 1-1 Site Location Plan



02.

Project Description

2. Project Description

2.1 Introduction

The Project comprises three main components, namely the uprating of existing overhead lines from 275 to 400kV, the construction of a new 400kV overhead line as well as works at five existing substations. There are additional ancillary works including the removal of an existing 132kV overhead line as well modifications to another. This section provides preliminary information on the design and construction of the Project.

2.2 Overview of a Typical Overhead Line

Overhead lines transmit electricity by conductors (often also referred to as ‘wires’) which are suspended at a specified height above ground and carried by wood poles or steel lattice towers (also referred to as pylons) which are located at regularly spaced intervals. The conductors can be made of aluminium or steel strands. Most overhead lines operating at 132kV and above carry two 3-phase circuits, with one circuit strung on each side of a steel tower as shown in the image in Figure 2-1 over the page. The conductors are strung from insulators which are attached to the cross arms of the towers and prevent the electric current from crossing to the tower. Insulators are made of material with a high resistance to electricity flow, for example glass or porcelain. An earth wire may also be required to provide protection from lightning strikes.

2.3 The New-build Overhead Line

Overview

The New-build Overhead Line will be carried on steel lattice towers. The precise tower type to be used is subject to detailed design but it is anticipated that L8 towers would be utilised. Figure 2-2 provides a schematic overview of L8 towers as well as images of in-situ towers near Bonnybridge Substation. There are broadly three types of towers which may be required along the new overhead line route subject to detailed design as set out in Table 2-1.

Table 2-1 Overhead Line Tower Types

Tower Type	Description
Suspension or Line Tower	These typically form most of an overhead line route and are used where the tower is part of a straight-line section of the overhead line route.
Tension or Angle Tower	These are used where an overhead line route changes direction where there is a horizontal or vertical deviation.
Terminal Tower	These are used when an overhead line route terminates at a substation or on to an underground cable section via a separate cable sealing end compound or platform.

Figure 2-1 Typical Operational 400kV Double Circuit OHL

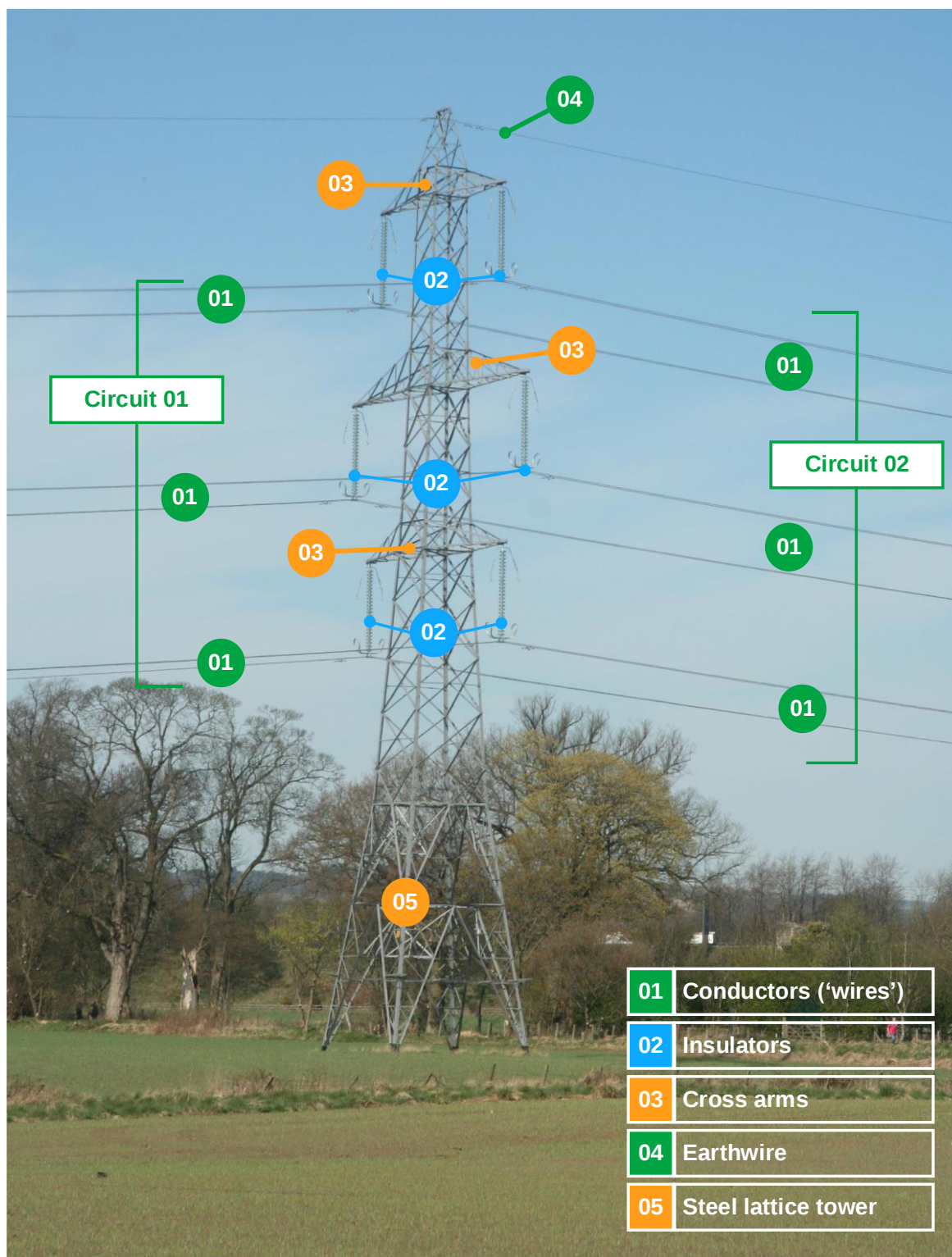
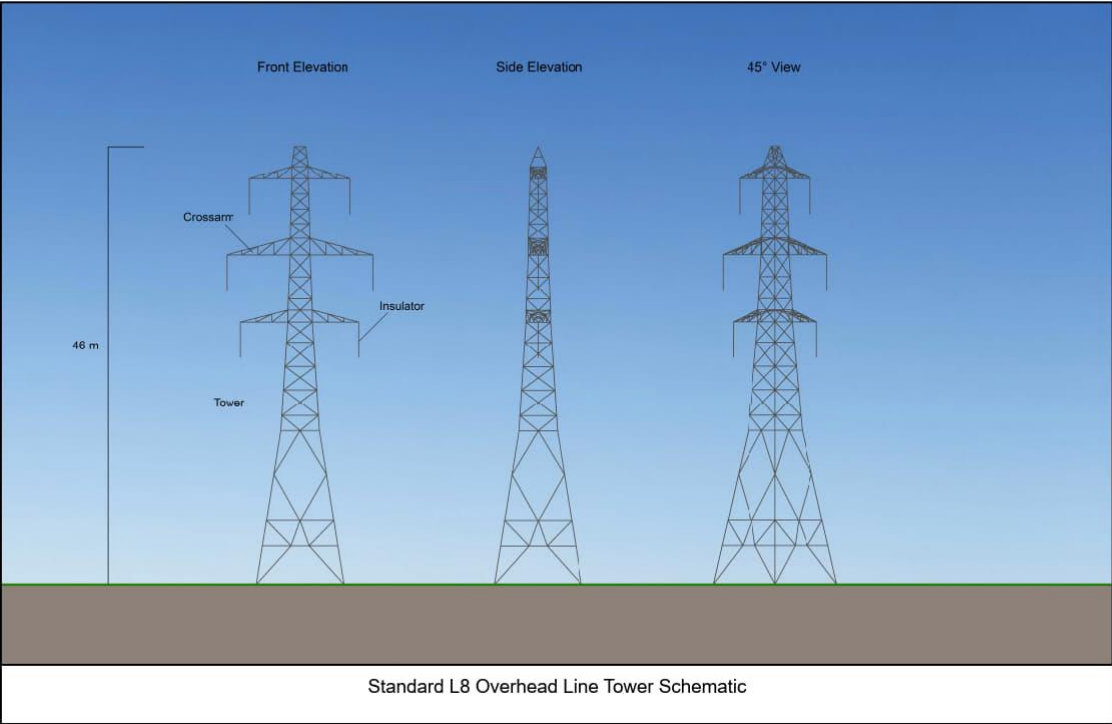


Figure 2-2 Overview of L8 Tower Designs

Revision: 1 Drawn: LC Checked: MLS Approved: DR Date: 2024-12-17

Filename: \\au.aecomnet.com\EMIA\UK\ED4\Jobs\PR-208814_Central_Upside\DW_1_Consultation\DW_1_Consultation.aprx



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PROJECT
Denny Wishaw Network Upgrade

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LEGEND

ISSUE PURPOSE
SCOPING REPORT

PROJECT NUMBER
60635450

FIGURE TITLE
Overview of L8 Tower Designs

FIGURE NUMBER
Figure 2.2

Figure 2.3 (Appendix A) provides an overview of the following project components:

- New-build - preferred route option (herein the New-build Overhead Line)
- ZG highlighted
- XX highlighted
- XR highlighted
- CB highlighted and AA sections to be undergrounded
- Substations highlighted by annotated points

New-build Overhead Line – Route Description

The New-build Overhead Line route is illustrated in Figure 2.4 (Appendix A). It starts on the western side of Bonnybridge Substation within Falkirk. It is routed to the south of the substation crossing two existing 132kV overhead lines routes, referred to as CB route and AA route, then heads southeast towards the Forth and Clyde Canal. This section of the New-build Overhead Line is located within the Antonine Wall World Heritage Site (WHS) Buffer Zone. From here the New-build Overhead Line crosses the Canal, Antonine Wall and railway lines in southern direction to Howie Rig. It then heads southwest largely following the existing CB route to the north/northwest of the Slamannan Plateau Special Protection Area (SPA). The New-build Overhead Line crosses into North Lanarkshire to the north of Fannyside Muir continuing towards Palacerigg Country Park. The New-build Overhead Line includes an approximate 750m spur which connects it to the existing Cumbernauld Substation and allows the existing CB route between Bonnybridge and Cumbernauld to be removed in its entirety. From Cumbernauld Substation the New-build Overhead Line is routed through part of Palacerigg Country Park heading south towards Greengairs. It is routed southwest from here crossing the A73 to the north of Riggend. From here the route heads south to the east of Glenmavis/west of Stand where it meets the reconfigured XX route. A new tee-shape arrangement would be formed to the northwest of Glenmavis with the XX route diverted to form a dogleg which would continue south over the B803 before connecting to the existing XX route to the west of the Albert Bartlett Factory.

New-build Overhead Line - Tower Design Details

L8 towers have a standard design height of 46m, however, this can vary up to approximately 63m according to the electrical safety clearance to the ground, which may be a factor when crossing areas such as roads or raised areas of ground.

The distance between adjacent towers, known as the ‘span length’, is approximately 300m but this can be increased where there is a requirement to span obstacles or decreased where a route traverses higher altitudes. The exact span distance will depend on site specific constraints or obstacles, however, in general there would typically be three to four steel towers per kilometre.

Steel towers are constructed from galvanised steel and typically grey in colour which becomes duller over time (approximately 18 months). The shade of grey is not distinguishable at distance and normally appears as grades of light and dark. Where towers are viewed against the sky, colour cannot be relied upon to diminish visibility, since the lighting characteristics of the sky vary greatly.

New-build Overhead Line – Construction

The construction of new overhead lines follows a well-established process. As well as the overhead line itself, it also requires additional temporary land-take and infrastructure; for example temporary accesses to steel tower locations and temporary construction compounds to store materials. Key phases of construction comprise the following activities:

- Tree felling or lopping (where required) to establish wayleaves or clearances;
- Preparation of temporary construction accesses;
- Excavation of foundations;

- Tower delivery;
- Erection of steel towers;
- Delivery of conductors and stringing equipment;
- Insulator and conductor fitting and tensioning; and
- Clearance and reinstatement.

The total duration of construction activity at any single tower site is approximately two weeks for tower foundations, one to two weeks for tower construction, and up to four weeks for conductor erection and stringing depending on the size of the tower and the number of the conductors to be strung. These periods are spread over about four months, with periods of inactivity between, or longer if construction difficulties are experienced elsewhere along the route or ground conditions prevent normal progress.

Prior to constructing the overhead line, temporary accesses will be constructed, as necessary, and laydown/storage areas established. Any trees which may impact on safety clearances will be removed or lopped. Following commissioning of the overhead line, all equipment and temporary access to construction areas will be removed with the land being reinstated to its former use/condition.

New-build Overhead Line – Operation and Maintenance

Overhead lines require minimal maintenance. The condition of tower steelwork and foundations is monitored regularly. Periodic painting of the tower steelwork may be required, and components are regularly inspected for corrosion, wear and deterioration. Towers which have deteriorated significantly may be dismantled carefully and replaced. There is also an ongoing requirement to ensure that any vegetation within proximity to the overhead line does not impact on safety clearances.

New-build Overhead Line – Decommissioning

The requirement to decommission an overhead line depends on a number of factors. At the end of its operational life, if an overhead line was required to be retained it could be repaired or refurbished in order to extend its operational life. If an overhead line was required to be decommissioned, steel towers would be removed with components re-used where possible. Foundations are removed to a minimum depth of approximately 1m below ground level, the area around the base of the tower is cleared and the ground reinstated.

2.4 Upgrading Existing Overhead Lines

Overview

In addition to the new overhead line, the ZG, XX and XR routes will require to be uprated from 275 to 400kV. The existing towers carry twelve conductors and an earth wire. Each conductor is joined to the tower cross arm via an insulator string (comprising glass/polymer dishes). The conductors, earth wire and insulators will require to be replaced as part of the uprating of ZG, XX and XR routes.

Upgraded Overhead Lines – Route Description

ZG Route

The ZG route is illustrated in Figure 2.5 (Appendix A). It is approximately 4km long extending from Denny North Substation to Bonnybridge Substation. It exits the substation in a southern direction through a wayleave within Tor Wood which is identified on the Ancient Woodland Inventory (AWI). It continues in a southeastern crossing the M876 before heading south crossing the River Carron and A883 terminating at Bonnybridge Substation.

XX Route

The XX route is illustrated in Figure 2.6 (Appendix A). It is approximately 15km long extending from Easterhouse Substation to Newarthill Substation. It is routed in an eastern direction from Easterhouse towards Glenmavis. It is currently routed east/southeast around Glenmavis but as part of the Project will be diverted to tie into the New-build Overhead Line. It continues south to the west of the Albert Bartlett Factory and then is routed to the northeast and east Airdrie on the margins of the settlement. It is routed through Chapelhall crossing the M8 to the west of Newhouse before terminating at Newarthill Substation.

XR Route

The XR route is illustrated in Figure 2.7 (Appendix A). It is approximately 16km extending from Newarthill Substation to Wishaw Substation. It is routed in a broadly eastern direction from Newarthill Substation towards Shotts then heads south between Newmains and Allanton. From here it is routed in a western/southwestern direction to the south of Wishaw before terminating at Wishaw Substation.

Upgraded Overhead Lines – Upgrading Works

The upgrading of the existing overhead lines will comprise of the following activities:

- Delivery of conductors and stringing equipment;
- Insulator and conductor fitting and tensioning; and
- Clearance and reinstatement.

Prior to upgrading the overhead line, temporary accesses will be constructed, as necessary, and laydown /storage areas established, usually mid-way along the route.

Linesmen will climb each tower and attach a pul-lift from tower crossarm to conductors. This allows the existing insulator to be unbolted before being lowered to the ground using a tractor and winch. The tractor and winch are then used to lift the new insulator on to the tower cross arm before being attached to the cross arm and conductors. Once the new insulator is in place, the pul-lift is removed. This process is then repeated for the remaining insulators on the tower.

Following commissioning of the upgraded overhead line, all equipment and temporary access of construction areas will be removed with the land being reinstated to its former use/condition.

Upgraded Overhead Lines – Operation and Maintenance

Operational and maintenance requirements for the Upgraded Overhead Lines are the same as those described for the New-build Overhead Line.

Upgraded Overhead Lines – Decommissioning

The decommissioning requirements for the Upgraded Overhead Lines are the same as those described for the New-build Overhead Line.

2.5 Ancillary Overhead Line Works

Removal of CB Route

The removal of the existing 132kV overhead line between Bonnybridge and Cumbernauld Substations ('CB route') would be undertaken in advance of construction of the New-build Overhead Line, parts of which would be constructed on the same or a similar alignment to the existing route. The removal of CB route (illustrated on Figure 2-8 in Appendix A) would follow the same approach to decommissioning as described above. Steel towers will be removed with components re-used where possible. Foundations would be removed to a minimum depth of approximately 1m below ground level with the area around the base of the tower cleared and the ground reinstated.

Undergrounding of AA Route

Subject to final design of the Project, sections of the existing 132kV overhead line between Bonnybridge and Bathgate Substations (illustrated on Figure 2-8 in Appendix A) would require to be undergrounded where it would be crossed by the New-build Overhead Line.

2.6 Substation Works

Overview

Substations play a key role in the electricity transmission system helping to manage and control electricity flows as well as connecting generators such as wind farms and/or connecting to the electricity distribution network at grid supply points (GSPs). As part of the Project works are required at a number of existing substations to facilitate the increase in operating voltage to 400kV. The following sections summarise the works required at each substation.

Denny North Substation

Denny North Substation is located approximately 1.7km north of Denny as shown on Figure 2.9 (Appendix A). Works at Denny North Substation are required due to the upgrading of the existing ZG route. These comprise works at the northern side of the existing substation including the installation of a new bay containing air insulated switchgear and an overhead line gantry tower. As part of the works the existing security fence would be extended.

Bonnybridge Substation

Bonnybridge Substation is located between Bonnybridge and Camelon as shown on Figure 2.9 (Appendix A). Works at Bonnybridge Substation are required due to the upgrading of the existing ZG route as well as the New-build Overhead Line. These comprise an extension of the existing to the southwest of the existing substation and installation of new electrical equipment including circuit breakers, inter-bus transformers and shunt reactors. The existing substation platform and associated security fencing would be extended as part of the works.

Cumbernauld Substation

Cumbernauld Substation is located to the east of Cumbernauld and south of Abronhill as shown on Figure 2.9 (Appendix A). Palacerigg Country Park is located to the south of the substation. Works at Cumbernauld Substation are required due to the removal of existing CB route and connection of the New-build Overhead Line. These comprise works to the south of the existing substation to extend the substation platform and installation of new electrical equipment including transformers and circuit breakers. As part of the extension, existing security fencing would be extended.

Easterhouse Substation

Easterhouse Substation is located south of Gartcosh to the east of the M73 as shown on Figure 2.9 (Appendix A). Woodend Loch Site of Special Scientific Interest (SSSI) is located to the south of the substation. Works at Easterhouse Substation are required due to the uprating of the existing XX route. The works are located on the southeast of the existing substation and comprise the installation of new electrical equipment including a circuit breaker.

Wishaw Substation

Wishaw Substation is located to south of Wishaw between the B574 and railway line as shown on Figure 2.9 (Appendix A). Works at Wishaw Substation are required due to the uprating of the existing XR route. These include an extension of the existing substation platform and associated security fencing as well as installation of three new bays containing gas insulated switchgear and circuit breaker.

2.7 Scoping Boundary

For the purposes of EIA scoping a boundary has been developed as illustrated in Figure 2-10 (Appendix A). based on the current level of design information for each of the components of the Project. This is not the final application boundary, however, is considered to be large enough to accommodate the Project including temporary construction requirements as the design is developed prior to making a consent application. It comprises all of the components of the Project:

- The New-build Overhead Line (the Preferred Route Option);
- The Uprated Overhead Lines (ZG, XX, and XR routes);
- For the ancillary overhead works (CB route and part of AA route); and
- For the ancillary substation works (the existing substations plus adjacent land).

2.8 Design compliance with UK Code of Practice on EMF

Electric and magnetic fields (EMF) are present wherever electricity is used. EMF are associated with all electricity transmission infrastructure. Health protection guidelines exist for both public and occupational exposure to time-varying electric, magnetic and electromagnetic fields with a frequency of up to 300GHz.

All new infrastructure associated with the Project will comply with the UK Government's guidelines set out within the voluntary Code of Practice set out within 'Power Lines:

Demonstrating compliance with EMF public exposure guidelines'⁶ (herein referred to as the 'Code of Practice'). The Code of Practice sets out what is required to demonstrate compliance with conservative exposure levels in respect of sources of EMFs within electricity systems, including high-voltage overhead lines.

SPEN (The Applicant) will ensure all electricity transmission infrastructure which they construct and operate complies with the Code of Practice. The requirements of the Code of Practice will be delivered through the Project design. Therefore, it is not considered that the Project would give rise to any significant effects resulting from electric or magnetic field impacts. Effects arising from EMF will be scoped out of the EIAR.

⁶ Power Lines: Demonstrating compliance with EMF public exposure guidelines (2012), UK Government Department of Energy & Climate Change <https://assets.publishing.service.gov.uk/media/5a796799ed915d07d35b5397/1256-code-practice-emf-public-exp-guidelines.pdf>

03.

Approach to EIA

3. Approach to EIA

3.1 Introduction

This chapter describes the general approach to and scope of the Environmental Impact Assessment (EIA) of the Project. It provides general information about the EIA process including the key steps taken in the approach to EIA to identify baseline conditions and identify potential impacts and assess likely significant effects. For a detailed description of topic specific assessment methods reference should be made to the relevant chapter.

3.2 About Environmental Impact Assessment

EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development. It promotes the early identification and evaluation of the likely significant environmental effects of the development and enables appropriate mitigation (that is measures to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the design of the development, or commitments to be made to environmentally sensitive construction methods and practices. The results of the EIA also ensure that decision-makers, such as the Scottish Ministers, LPAs and statutory consultees as well as other interested parties including local communities, are aware of a proposed development's potential environmental impacts and whether these may be significant or not so that they may be considered in the determination of an application for planning permission.

3.3 Overview of EIA Scoping Requirements

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the 'EIA Regulations'), Regulation 12(2), set out what information must be provided to the Scottish Ministers when requesting their scoping opinion. These requirements and where they are addressed in this Scoping Report are set out in Table 3-1 below.

Table 3-1 EIA Regulations - Scoping Requirements

Legislative Requirements	Detail
A description of the location of the development, including a plan sufficient to identify the land	Chapter 2 and associated figures provide a description and illustration of the location of the Denny to Wishaw Network Upgrade.
A brief description of the nature and purpose of the development and of its likely significant effects on the environment	Chapter 1 and 2 provide a description of Project and its key components setting out its nature and purpose with Chapters 5 to 16 providing an overview of the environmental aspects which may be affected. These sections include a brief description of the relevant baseline environment and study area, and the proposed assessment methods; and the initial identification of potential environmental impacts

Legislative Requirements	Detail
	and likely significant effects. Chapter 14 provides a summary of the proposed scope of the EIA.
Such other information or representations as the developer may wish to provide or make	Chapters 1 and 2 also provide background information relating to the Project and why it needed with regard to UK and Scottish Government policies and targets. Chapter 4 also provides an overview of the relevant planning policy.

3.4 General Approach to EIA

Overview

In general terms, the key stages in the EIA are:

- **Scoping studies:** Scoping is the first step in the EIA process. Regulation 12 allows developers to request a scoping opinion as to the content of an EIA Report i.e. the scope of and approach to EIA including the baseline studies undertaken, sources of data, approaches to assessment and specific impacts to consider. This Scoping Report forms part of the scoping stage and accompanies a request for a scoping opinion.
- **Baseline studies and consultation:** These comprise a combination of desk-based studies and field surveys to establish an understanding of the existing environmental conditions ('the baseline') within the study area and therefore ensure an accurate assessment of the likely significant effects of the Project. Some baseline surveys have been undertaken previously and this is reported in the relevant chapters of this report.
- **Impact prediction and identification of mitigation:** The potential environmental impacts of the Project (both beneficial and adverse) will be predicted and evaluated using a range of specialist methods which are described in subsequent chapters. Through iterative assessment, potential impacts will be predicted and opportunities to mitigate them identified, with the aim of preventing or reducing likely significant effects as much as possible. Where possible mitigation measures will be incorporated into the design of the Project such that they inform its detailed design and / or how it shall be constructed.
- **Identification of likely significant effects:** As stated above, the purpose of the EIA is to determine the likely significant effects of the Project. A detailed description of the general approach to assessing impacts is contained in this chapter, with detailed approaches tailored to individual technical assessments following topic-specific guidance contained in subsequent chapters. The EIAR will identify the significance of potential effects, identify any additional mitigation and then the significance of the residual effects of the Project i.e. those which remain, taking into account mitigation.

Characterisation of the Baseline Environment

In order to assess the likely significant effects resulting from the Project it is necessary to first establish the environmental conditions that currently exist along and within the vicinity of the Project (referred to as 'the baseline') as well as the likely evolution of the baseline without the Project. An understanding of the baseline environment for each environmental topic will be collated through a range of activities including field surveys to make observations and/or

record data, desk-based studies including reviews of relevant documentation and literature as well as stakeholder consultation. Subsequent sections of this Scoping Report set out proposed baseline studies and sources of information which are proposed to be used in undertaking the EIA of the Project.

Types of Effects

Direct Effects and Indirect Effects

Direct effects are those where there is a physical connection between the Project and the receptor (for example, direct impacts on a sensitive ecological receptor resulting from habitat removal), whereas indirect effects require some additional pathway for the effect to arise (for example, impacts on surface water quality on other watercourses within the catchment from spillage risk).

Temporary Effects

Temporary effects mainly occur during the construction phase only and are typically short term. This would include effects resulting from the construction of the Project such as construction traffic, noise and vibration from construction plant and machinery, dust generation and site runoff, as well as effects resulting from temporary loss of agricultural land or other temporary effects resulting from requirements for temporary access tracks or construction compounds.

Longer Term, Operational & Permanent Effects

Longer term, operational and permanent effects are those which would occur as a result of the Project, such as its land take or as a result of its operation. This would include effects which may begin during construction and endure for the lifetime of the Project, or effects which occur for a period of time following completion of construction or during operation only.

Decommissioning Effects

Decommissioning effects would be those which would occur as a result of the removal of the Project at the end of its operational life. It is generally the case that rather than decommissioning, assets within the substation would be refurbished or replaced in order to extend its operational life. Given the lifespan of Project and the effects associated with decommissioning being similar to those of construction, it proposed to scope decommissioning effects out of the EIA.

Residual Effects

Residual effects are those effects that remain having taken account of mitigation measures. As noted above, the approach taken to the EIA of the Project means that much of the mitigation is an inherent part of the design (design measures) and how it will be constructed (management measures). As a result, the significance of some residual environmental effects may be the same as the significance of the potential environmental effects. It should be noted that this is not because they have not been mitigated, but rather that by incorporating mitigation into the design and construction of the Project from the outset, effects have been mitigated as far as possible. In subsequent chapters, this means that there may be more substantive reporting of the potential effects as opposed to the residual effects.

Cumulative Effects

For the purpose of the EIA cumulative effects have been defined under two categories; intra-project effects and inter-project effects:

- **Intra-Project Effects:** The combined effects arising as a result of the Project upon a single receptor or resource. An example would be where a local resident is affected by dust, noise and a loss of visual amenity during the construction of the substation, with the result being a greater nuisance than each individual effect alone.
- **Inter-Project Effects:** The combined effects of the Project with other reasonably foreseeable relevant development which may not, on an individual basis result in significant effects but, together (i.e. cumulatively), have a significant effect. Other projects to be considered as part of the assessment will be agreed with the LPAs.

Identification and Assessment of Likely Significant Effects

Overview

The likely significant effects (beneficial and adverse) of the Project will be predicted and evaluated using a range of predictive methods including quantitative, semi-qualitative and qualitative techniques.

There is no statutory definition of what constitutes a ‘significant’ effect within the EIA Regulations. The process of assessing significance typically involves consideration of two aspects of a potential effect, namely the sensitivity and/or value of the environmental aspect or receptor being affected, and the magnitude of the impact on it.

Assessing the sensitivity, value or importance of receptors

The sensitivity of a receptor or feature is characterised by its vulnerability to change and its ability to recover. The value of a receptor or feature reflects its overall importance and the value placed on it by society; this may be reflected by its level of statutory or policy protection or else a value may be attributed through consultation and the application of professional judgement. Criteria for defining the sensitivity and/or value of a receptor are set out in Table 3-2.

Table 3-2 Sensitivity Criteria

Sensitivity	Description
Very high	Very high importance and rarity, value at an international level and limited potential for recovery or substitution
High	High importance and rarity, value at a national level and limited potential for recovery or substitution.
Medium	Medium importance and rarity, value at a regional level and limited potential for recovery or substitution.
Low	Low or medium importance and rarity, value at local level and limited potential for recovery or substitution.

Sensitivity	Description
Negligible	Not considered to be important, valued at a local level, easy to replace

Assessing the magnitude of impacts

General criteria for defining the magnitude of an impact are set out in Table 3-3. Key factors that influence this include:

- Scale of change – the scale of change refers to the degree of change to or from the baseline environment caused by the impact being assessed;
- Spatial extent – the extent of an impact is the full area over which the impact occurs or is experienced; and
- Duration and frequency – the duration is the period within which the impact is expected to last prior to recovery or replacement of the feature. Frequency refers to how often the impact will occur.

Table 3-3 Magnitude Criteria

Magnitude	Description
High	Adverse: Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features, or elements. Beneficial: Large scale or major improvement of resource, including extensive restoration or major improvement of attribute quality.
Medium	Adverse: Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Beneficial: Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse: Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial: Minor benefit to, or in addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk or negative impact occurring.
Negligible	Adverse: Very minor loss of detrimental alteration to one or more characteristics, features or elements. Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements

Evaluating the significance of effects

Having established the magnitude of change and the sensitivity of the receptor the significance of the effect can be assessed. The identification of significance typically

requires the application of professional judgement, however, a significance matrix may also be used as a guide to help identify the likely significance of effects. Each of the specialist disciplines undertaking EIA may have a variation of the table below that aligns with magnitude and sensitivity criteria that best suits their topic area, which may also be defined by relevant industry guidelines. These criteria and determination of significance are outlined in the specialist sections of this Scoping Report.

Table 3-4 Assessment of Significance

		Sensitivity of Receptor				
Magnitude of Impact		Very High	High	Medium	Low	Negligible
	High	Major	Major	Moderate	Moderate	Minor
	Medium	Major	Moderate	Moderate	Minor	Negligible
	Low	Moderate	Moderate	Minor	Negligible	Negligible
	Negligible	Minor	Minor	Negligible	Negligible	Negligible

The EIA Regulations require the likely significant effects to be identified. The classification of significance is explained in Table 3-5, however, in simple terms effects predicted to be ‘major’ or ‘moderate’ are considered to be ‘significant’ whilst effects predicted to be ‘minor’ or ‘negligible’ are considered to be ‘not significant’.

Table 3-5 Significance Classifications

Classification	Description	Significant
Major	A large and/or detrimental change to a valuable/sensitive receptor; likely or apparent exceeding of accepted (often legal) threshold or a major departure from national targets. A large and beneficial change, resulting in improvements to baseline conditions whereby previously poor conditions are replaced by compliance with accepted (often legal) thresholds or a major contribution is made to national targets. These are effects which may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to impacts on resources or features which are rare and cannot be relocated, or if lost, cannot be replaced.	Yes

Classification	Description	Significant
Moderate	A medium scale change which, although not beyond an accepted (often legal) threshold, is still considered to be generally unacceptable, unless balanced out by other significant positive benefits of the development. Likely to relate to departure from relevant planning policy, rather than legal compliance. A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets are contributed to. These effects, if adverse, are likely to be important at a local or district scale and on their own could have a material influence on decision-making.	Yes (typically) ⁷
Minor	A small change that, whilst adverse, does not exceed accepted thresholds, legal or guideline standards. Unlikely to be a departure from planning policy. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues but are typically unlikely to be critical in the decision-making process.	No
Negligible	A very small scape change that is so small and unimportant that it is considered acceptable to disregard. Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making irrespective of other effects	No

A significant adverse effect is not necessarily one that would render the Project unacceptable, nor is a significant beneficial effect necessarily one that would make it acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties, in particular decision-makers, are aware of the environmental impacts (in particular those which are likely to be significant) of the Project and consider these alongside other material considerations in determining the applications for consent under section 37 of the Electricity Act 1989.

Approach to Mitigation

A standard hierarchical approach to identifying mitigation requirements will be used:

⁷ Moderate effects are typically significant but may be subject to the application of professional judgement for each EIA topic

- **Avoid or Prevent:** In the first instance, mitigation should seek to avoid or prevent the adverse effect at source.
- **Reduce:** If the effect is unavoidable, mitigation measures should be implemented which seek to reduce the significance of the effect.
- **Offset:** If the effect can neither be avoided nor reduced, mitigation should seek to offset the effect through the implementation of compensatory mitigation.

Mitigation measures fall into two categories: 'mitigation by design' which forms part of the Project; and 'Project Specific Mitigation' which is in addition to design commitments and which are identified as a result of the assessment the Project:

- **Mitigation by Design:** The Project is being developed through an iterative process which involves seeking to avoid or reduce potential environmental effects through the appropriate routeing and siting of the key infrastructure.
- **Project Specific Mitigation:** Project specific mitigation refers to measures which will be identified and proposed as a result of the assessment. These will be presented within each of the topic chapters. These will be identified to further avoid or reduce identified likely significant adverse environmental effects where they cannot be mitigated through the design of the Project.

Assessment of Residual Effects

Residual effects are those that are predicted to remain after mitigation measures have been implemented. The significance of residual effects is assessed using the criteria described in preceding sections. As noted above the approach taken to the EIA of the Project means that much of the mitigation is an inherent part of its design and how it will be constructed. As a result, the significance of some residual environmental effects may be the same as the significance of the potential environmental effects. It should be noted that this is not because they have not been mitigated but rather that by incorporating mitigation into the design and construction of the Project from the outset effects have been mitigated as far as possible. This may mean that there is more substantive reporting of the potential effects as opposed to the residual effects.

04.

Planning Policy Context

4. Planning Policy Context

4.1 Introduction

As outlined in Section 1.2, the Applicant intends to submit four separate applications to the Scottish Ministers for consent under Section 37 of the Electricity Act 1989 for each of the Upgraded Overhead Lines as well as the New-build Overhead Line. At the same time, the Applicant will also apply to the Scottish Ministers for deemed planning permission under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997 for the Upgraded Overhead Lines, New-build Overhead Line, and ancillary development including works at the substations.

It should be noted that following Scoping there is the option for the substation works to be progressed as five separate planning applications to the relevant Local Planning Authorities (LPAs) under the Town and Country Planning (Scotland) Act 1997. Should this approach be taken, the applications would be progressed as national developments to reflect their status in National Planning Framework 4 (NPF4)⁸.

The Planning Policy chapter and Planning Statements accompanying the applications will summarise the relevant national, regional, and local planning policy guidance, as well as Development Plan policies pertinent to the Project. The Planning Statement will assess the Project against these policies. Policies related to environmental aspects will be examined in the relevant technical chapters of the EIAR.

Planning policies and strategies applicable to the Project will be identified through document review and consultation with Falkirk Council (FC), North Lanarkshire Council (NLC) and statutory consultees. The policies and plans to be considered as part of the assessment are outlined below.

4.2 Energy Policy Context

The following list of International, UK and Scottish Government legislation, policies and plans regarding energy will be included and summarised in the Planning Policy chapter of the EIAR, along with any other pertinent new pieces of legislation, policy or guidance:

International Legislation and Policy

- The Paris Agreement (2015)⁹;
- United Nations – Intergovernmental Panel on Climate Change¹⁰;
- United Nations Emissions Gap Report (2024)¹¹; and,

⁸ National Planning Framework 4 (2023), Scottish Government <https://www.gov.scot/publications/national-planning-framework-4/documents/>

⁹ The Paris Agreement (2015), United Nations Climate Change <https://unfccc.int/process-and-meetings/the-paris-agreement>

¹⁰ United Nations– Intergovernmental Panel on Climate Change <https://www.ipcc.ch/>

¹¹ Emissions Gap Report (2024), United Nations Environment Programme <https://www.unep.org/resources/emissions-gap-report-2024>

- 29th Conference of the Parties (COP 29) (2024)¹².

UK Legislation and Policy

- Climate Change Act 2008 (as amended)¹³;
- Committee on Climate Change Sixth Carbon Budget (2020)¹⁴;
- British Energy Security Strategy (2022)¹⁵;
- The Energy Security Act (2023)¹⁶; and,
- Climate Change Committee Progress Report to Parliament (2024)¹⁷.

Scottish Legislation and Policy

- Climate Change (Scotland) Act 2009¹⁸ and Climate Change (Emissions Reductions Targets) (Scotland) Act 2019¹⁹;
- Scottish Energy Strategy (2017)²⁰;
- Update on the Climate Change Plan 2018 – 2032: Security a Green Recovery on a Path to Net Zero (2020)²¹;
- Scottish Emissions Targets (First Five-Yearly Review and Progress in Reducing Emissions in Scotland – Report to Parliament (2022)²²;
- The Climate Change (Scotland) Act 2009 (Interim Target) Amendment Regulations (2023)²³;
- Draft Energy Strategy and Just Transition Plan (2023)²⁴;
- Programme for Government 2024-25: Serving Scotland (2024)²⁵;

¹² UN Climate Conference Baku- November 2024 (2024) United Nations <https://unfccc.int/cop29>

¹³ Climate Change Act (2008), UK Government <https://www.legislation.gov.uk/ukpga/2008/27/contents>

¹⁴ Sixth Carbon Budget (2020), Committee on Climate Change <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

¹⁵ British Energy Security Strategy (2022), UK Government <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

¹⁶ Energy Security Act (2023), UK Government <https://www.legislation.gov.uk/ukpga/2023/52>

¹⁷ Progress Report to Parliament (2024), Committee on Climate Change <https://www.theccc.org.uk/publication/progress-in-reducing-emissions-2024-report-to-parliament/>

¹⁸ Climate Change (Scotland) Act (2009), Scottish Government <https://www.legislation.gov.uk/asp/2009/12/contents>

¹⁹ Climate Change (Emissions Reductions Targets) (Scotland) Act 2019, Scottish Government <https://www.legislation.gov.uk/asp/2019/15/enacted>

²⁰ Scottish Energy Strategy (2017), Scottish Government <https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/>

²¹ Security a green recovery on a path to net zero: climate change plan 2018-2032 – update (2020), Scottish Government <https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/pages/2/>

²² Scottish Emissions Reductions Targets – First Five-Yearly Review & Progress in Reducing Emissions in Scotland (2022), Committee on Climate Change <https://www.theccc.org.uk/publication/scottish-emission-targets-progress-in-reducing-emissions-in-scotland-2022-report-to-parliament/#downloads>

²³ Climate Change (Scotland) Act 2009 interim target amendment regulations (2023), Scottish Government [https://www.gov.scot/publications/climate-change-scotland-act-2009-interim-target-amendments/#:%7E:text=The%20Climate%20Change%20\(Scotland\)%20Act%202009%20\(Interim%20Target\),for%20the%202020%20interim%20target](https://www.gov.scot/publications/climate-change-scotland-act-2009-interim-target-amendments/#:%7E:text=The%20Climate%20Change%20(Scotland)%20Act%202009%20(Interim%20Target),for%20the%202020%20interim%20target)

²⁴ Draft Energy Strategy and Just Transition Plan (2023), Scottish Government <https://www.gov.scot/publications/draft-energy-strategy-transition-plan/>

²⁵ Programme for Government 2024 to 2025 (2024), Scottish Government <https://www.gov.scot/publications/programme-government-2024-25-serving-scotland/>

- Climate Change: Scottish National Adaptation Plan 2024-2029²⁶; and,
- Green Industrial Strategy (2024)²⁷.

4.3 The Development Plan

Overview

Through modifications introduced by the Planning (Scotland) Act 2019, Section 24 of the Town and Country Planning (Scotland) Act 1997²⁸ stipulates that the Development Plan comprises the National Planning Framework (NPF) and the Local Development Plan (LDP) for the area. Therefore, the Development Plan for the Project comprises NPF4 as well as the LDPs for FC and NLC; the Falkirk LDP2 (adopted 2020)²⁹ and North Lanarkshire LDP (adopted 2022)³⁰ respectively.

National Planning Framework 4

NPF4⁸ sets out how the Scottish Government's approach to planning and development will help to achieve a net zero, sustainable Scotland by 2045. It also identifies 18 National Developments which are developments of national importance that will help deliver the spatial strategy. Any development which has been given a National Development status is considered to be acceptable in principle. This includes 'Strategic Renewable Electricity Generation and Transmission Infrastructure'. This is outlined in Section 3 of Annex B, which states that this National Development supports renewable electricity generation, repowering, and expansion of the electricity grid.

Development involving the delivery of 'Strategic Renewable Electricity Generation and Transmission Infrastructure', is classed as a 'National Development' in NPF4⁸, if it is of a scale or type that would otherwise have been classed as 'major' by 'The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009'³¹. This includes development of a description mentioned in Schedule 1 of the EIA Regulations (i.e. Schedule 1 Development) which the Project includes. The Project is new electricity transmission network infrastructure supporting increased renewable energy generation, it would be classed as 'National Development' and would assist in the delivery of the Spatial Strategy for Scotland.

NPF4⁸ must be read as a whole, and its 33 policies are to be used as a guide to decision making. Where there is a conflict between NPF4⁸ and the LDP policy, NPF4⁸ takes precedence given that it is the more recently adopted plan in comparison to the two relevant LDPs.

²⁶ Climate Change: Scottish National Adaptation Plan 2024 – 2029 (2024), Scottish Government

<https://www.gov.scot/publications/scottish-national-adaptation-plan-2024-2029-2/documents/>

²⁷ Green Industrial Strategy (2024), Scottish Government <https://www.gov.scot/publications/green-industrial-strategy/>

²⁸ Town and Country Planning (Scotland) Act 1997 (1997), Scottish Government

<https://www.legislation.gov.uk/ukpga/1997/8/contents>

²⁹ Falkirk Local Development Plan 2 (2020), Falkirk Council <https://www.falkirk.gov.uk/services/planning-building/planning-policy/local-development-plan/>

³⁰ North Lanarkshire Council Local Development Plan (2022), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/planning-and-building/development-plans/current-north-lanarkshire-local-development-plan>

³¹ The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009 (2009), Scottish Government <https://www.legislation.gov.uk/sdsi/2009/9780111001714/regulation/1>

Table 4-1 summarises relevant NPF4⁸ policies and related EIA topics.

Table 4-1 Summary of Relevant Planning Policies

NPF4 Policy	Summary	Relevant EIA Topics
Policy 1: Tackling the climate and nature crises	Policy 1 states that significant consideration will be given to the global climate and nature crises in evaluating all development proposals.	- Ecology and Biodiversity; and. - Climate Change
Policy 2: Climate mitigation and adaptation	Policy 2 states that development should be designated to minimise emissions in alignment with national decarbonisation targets.	- Water Environment; and - Climate Change.
Policy 3: Biodiversity	Policy 3 states that development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible. For development subject to EIA, Policy 3b specifies that support will be granted only if proposals demonstrate conservation, restoration, and enhancement of biodiversity, including nature networks, resulting in a demonstrably better state than without intervention. To provide clarity on NPF4 Policy 3, the Scottish Government published Draft Planning Guidance on Biodiversity in November 2023. Although labelled as ‘Draft Guidance’ it is intended for immediate use to aid in the implementation and delivery of Policy 3.	Ecology and Biodiversity.
Policy 4: Natural Places	Policy 4 seeks to protect, restore, and enhance natural assets by making the best use of nature-based solutions. Development proposals that affect a site designated as a local nature conservation site or landscape area in the Local Development Plan will only be supported if: The development will not have significant adverse effects on the	- Landscape and Visual; and - Ecology and Biodiversity.

NPF4 Policy	Summary	Relevant EIA Topics
	integrity of the area or the qualities for which it has been identified; or Any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental, or economic benefits or at least local importance.	
Policy 5: Soils	Policy 5 aims to protect carbon-rich soils, restore peatlands, and minimise soil disturbance from development.	- Geology and Soils; - Climate Change; and - Ecology and Biodiversity.
Policy 6: Forestry, Woodland, and Trees	Policy 6 focuses on protecting and expanding forests, woodlands, and trees.	- Ecology and Biodiversity; - Climate Change; and - Land Use, Recreation and Socio- economics.
Policy 7: Historic Assets and Places	Policy 7 seeks to protect and enhance historic environment assets and places, while also enabling positive change as a catalyst for the regeneration of these areas.	Cultural Heritage and Archaeology.
Policy 11: Energy	Policy 11 supports development proposals for all forms of renewable, low-carbon, and zero-emission technologies. This includes energy generation, storage, and new or replacement transmission and distribution infrastructure. Proposals will be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated businesses, and supply chain opportunities. In addition, project design and mitigation must demonstrate how the following impacts are addressed:	- Landscape and Visual; - Ecology and Biodiversity; - Water Environment; - Cultural Heritage and Archaeology; and - Traffic and Transport; - Noise and Vibration; - Geology and Soils

NPF4 Policy	Summary	Relevant EIA Topics
	• <i>“impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;</i> • <i>significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/or appropriate design mitigation has been applied, they will generally be considered to be acceptable;</i> • <i>public access, including impact on long distance walking and cycling routes and scenic routes;</i> • <i>impact on aviation and defence interests including seismological recording;</i> • <i>impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised; impacts on road traffic and on adjacent trunk roads, including during construction;</i> • <i>impacts on historic environment;</i> • <i>effects on hydrology, the water environment and flood risk;</i> • <i>biodiversity including impacts on birds;</i> • <i>impacts on trees, woods and forests;</i> • <i>proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;</i> • <i>the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and</i> • <i>cumulative impacts.”</i> In considering these impacts, significant weight will be placed on the contribution of	• Climate Change; and • Land Use, Recreation and Socio-Economics.

NPF4 Policy	Summary	Relevant EIA Topics
	the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets.	
Policy 13: Sustainable Transport	Policy 13 supports proposals to improve, enhance, or provide active travel infrastructure, or multi-modal hubs. Development proposals will be supported if it can be demonstrated that the transport requirements generated have been considered in alignment with the sustainable travel and investment hierarchies.	• Traffic and Transport.
Policy 14: Design, Quality and Place	Policy 14 states that development proposals will be supported if they are consistent with the following six qualities of successful places, which are expanded upon in Annex D of NPF4: • Healthy: Supporting the prioritisation of women's safety and improving physical and mental health; • Pleasant: Supporting attractive natural and built spaces; • Connected: Supporting well connected networks that make moving around easy and reducing car dependency; • Distinctive: Supporting attention to detail of local architectural styles and natural landscapes to be interpreted, literally or creatively, into designs to reinforce identity; • Sustainable: Supporting the efficient use of resources that will allow people to live, play, work and stay in their area, ensuring climate resilience, and integrating nature positive biodiversity solutions; and • Adaptable: Supporting commitment to investing in the long-term value of buildings, streets and spaces by allowing for flexibility so that they can be changed quickly to accommodate	• Landscape and Visual; • Ecology and Biodiversity; • Water Environment; • Cultural Heritage and Archaeology; • Traffic and Transport; • Noise and Vibration; • Climate Change; and • Land Use, Recreation and Socio-Economic.

NPF4 Policy	Summary	Relevant EIA Topics
	different uses as well as maintained over time.	
Policy 18: Infrastructure First	Policy 18 seeks to encourage, promote and facilitate an infrastructure first approach to land use planning, which puts infrastructure considerations at the heart of placemaking.	- Traffic and Transport; and - Land Use, Recreation and Socio-Economics.
Policy 22: Flood Risk and Water Management	Policy 22 aims to enhance resilience as the primary approach and reducing the vulnerability of both existing and future developments to flooding.	- Water Environment; and - Climate Change.
Policy 23: Health and Safety	Policy 23 aims to protect people and places from environmental harm mitigate risks from safety hazards and encourage, promote, and facilitate development that enhances health and well-being.	Land use, Recreation and Socio-Economics.

Falkirk LDP2 (2020)

The Falkirk LDP2²⁹ was adopted in 2020. It is the statutory document which guides future development in the FC area for the period 2020-2040. It is relevant to a number of components of the Project, including approximately 8km of the New-build Overhead Line, one of the Upgraded Overhead Lines (the ZG route) as well as works at Bonnybridge and Denny North.

Table 4-2 summarises relevant Falkirk LDP2²⁹ policies and related EIA topics.

Table 4-2 Relevant Falkirk LDP2 Policies

FLDP2 Policy	Summary	Relevant EIA Topics
PE05: Antonine Wall	PE05 aims to retain, protect, preserve and enhance the Antonine Wall, its associated archaeology, character and setting.	Cultural Heritage and Archaeology.
PE06: Archaeological Sites	PE06 aims to protect scheduled monuments and other nationally important archaeological sites. Developments adversely affecting these sites will not be permitted unless in exceptional circumstances.	Cultural Heritage and Archaeology.

FLDP2 Policy	Summary	Relevant EIA Topics
PE07: Listed Buildings	PE07 states that development proposals within the curtilage or affecting the setting of a listed building should not adversely affect the character, appearance, special architectural or historic interest of the building or its setting.	Cultural Heritage and Archaeology.
PE08: Conservation Areas	PE08 states that new developments must preserve the character of Conservation Areas.	Cultural Heritage and Archaeology.
PE09: Areas of Townscape Value	PE09 recognises areas of historic or architectural merit that are not designated Conservation Areas and states that development should respect historic patterns, setting, style, and materials.	- Cultural Heritage and Archaeology; - Landscape and Visual.
PE10: Historic Gardens and Designed Landscapes	PE10 aims to ensure that development will not harm sites listed in the Inventory of Gardens and Designed Landscapes.	- Cultural Heritage and Archaeology; - Landscape and Visual.
PE13: Green and Blue Network	PE13 encourages integration of developments with green and blue networks. Developments should support biodiversity, climate change adaptation, and access to open spaces.	- Ecology and Biodiversity; - Water Environment; - Climate Change; and - Land Use, Recreation and Socio-Economics.
PE14: Countryside	PE14 aims to protect rural character. Development proposals in the countryside should demonstrate that their scale, siting and design is such that there will be no significant adverse impact on the rural environment.	Landscape and Visual.
PE16: Protection of Open Space	PE16 states that developments leading to the loss of open space will only be allowed if there is no significant	Ecology and Biodiversity; and

FLDP2 Policy	Summary	Relevant EIA Topics
	adverse effect on amenity, ecology, or the wider green network.	Land Use, Recreation and Socio-Economics.
PE18: Landscape	PE18 seeks to protect and enhance landscape character. Developments in Local Landscape Areas should minimise adverse visual impacts.	Landscape and Visual.
PE19: Biodiversity and Geodiversity	PE19 aims to protect Important habitats and species. Developments should integrate biodiversity enhancements and avoid significant negative impacts.	- Ecology and Biodiversity; and - Climate Change.
PE20: Trees, Woodland, and Hedgerows	PE20 aims to protect existing trees, woodlands, and hedgerows and requires mitigation for any tree loss due to development.	- Ecology and Biodiversity; and - Landscape and Visual.
PE22: The Water Environment	PE22 states that there will be a general presumption against development which would have a detrimental effect on the integrity and water quality of aquatic and riparian ecosystems, or which would lead to deterioration of the ecological status of any element of the water environment.	- Ecology and Biodiversity; and - Water Environment.
PE24: Flood Management	PE24 states that developments must consider flood risk and incorporate mitigation measures.	- Water Environment; and - Climate Change.
PE25: Soils and Agricultural Land	PE25 aims to protect prime agricultural land and carbon-rich soils. Developments should minimise soil disturbance and loss.	- Geology and Soils; - Climate Change; and - Land Use, Recreation and Socio-Economics.
PE26: Air Quality	PE26 states that development should not exacerbate existing air quality issues or introduce new sources of pollution which impact on local air quality without appropriate mitigation.	- Air Quality; and - Climate Change.

FLDP2 Policy	Summary	Relevant EIA Topics
PE27: Vacant, Derelict, Unstable and Contaminated Land	PE27 requires appropriate site investigations and remediation measures where appropriate.	• Geology and Soils.
IR12: Energy Generation Development	IR12 supports the development of energy infrastructure, including transmission lines, provided they do not have unacceptable environmental or community impacts.	• Ecology and Biodiversity; • Cultural Heritage and Archaeology; • Landscape and Visual; • Water Environment; • Geology and Soils; • Traffic and Transport; • Noise and Vibration; • Land Use, Recreation and Socio-Economics; • Air Quality; • Climate Change; and • Human Health.

The following Supplementary Guidance is also considered relevant to the Project:

- SG07: Biodiversity and Development³²;
- SG08: Local Nature Conservation and Geodiversity Sites³³;
- SG09: Landscape Character Assessment and Landscape Design³⁴;
- SG10: Trees and Development³⁵;
- SG11: Frontiers of the Roman Empire (Antonine Wall) World Heritage Sites³⁶; and,

³² Biodiversity and Development Supplementary Guidance SG07 (May 2021), Falkirk Council
<https://fcwebsites.blob.core.windows.net/www/media/79bfd8da-6f77-4e32-bbf4-6ed066c9f70f/08%20SG07%20Biodiversity%20and%20Development.pdf>

³³ Local Nature Conservation and Geodiversity Sites Supplementary Guidance SG08 (November 2022), Falkirk Council
<https://www.falkirk.gov.uk/media/bdfaf1d9-dd7b-4604-939e-b3c4ee350a6d>

³⁴ Landscape Character Assessment and Landscape Design Supplementary Guidance SG 09 (April 2021), Falkirk Council
<https://www.falkirk.gov.uk/media/bdfaf1d9-dd7b-4604-939e-b3c4ee350a6d>

³⁵ Trees and Development Supplementary Guidance SG10 (November 2020), Falkirk Council
<https://www.falkirk.gov.uk/media/7661b72b-7b4d-4dc2-8689-b2e23aaff5ba>

³⁶ Frontiers of the Roman Empire (Antonine Wall) World Heritage Site Supplementary Guidance SG11 (December 2023), Falkirk Council
<https://www.falkirk.gov.uk/media/f01f76d0-24c7-4635-b1e9-bb11e261a78d>

- SG12: Listed Buildings and Unlisted Properties in Conservation Areas³⁷.

North Lanarkshire LDP (2022)

The North Lanarkshire LDP³⁰ was adopted in 2022. It is five-to-ten-year strategy to guide physical development within the NLC area. It is relevant to a number of components of the Project, including approximately 12km of the New-build Overhead Line, two of the Upgraded Overhead Lines (the XX and XR routes), as well as works at Cumbernauld, Easterhouse, Newarthill and Wishaw Substations.

Table 4-3 summarises relevant North Lanarkshire LDP policies and related EIA topics.

Table 4-3 Relevant North Lanarkshire LDP Policies

NLLDP2 Policy	Summary	Relevant EIA Topics
PROM LOC4: Special Landscape Areas & Green Network Improvements	PROM LOC4 encourages development to consider the character and special qualities of special Landscape Areas and supports enhancement of the Green Network.	• Ecology and Biodiversity; • Landscape and Visual; and • Land Use, Recreation and Socio-Economics.
PROM ID2: Utilities Improvements	PROM ID2 supports utilities development in principle, subject to impact on visual amenity, traffic and highway safety and noise and disturbance.	• Landscape and Visual. • Traffic and Transport; and • Noise and Vibration.
PROT A: Natural Environment and Green Network Assets	PROT A aims to protect natural environment assets, including Special Areas of Conservation (SAC), SSSI, ancient woodlands, and Special Landscape Areas.	• Ecology and Biodiversity; • Water Environment; • Geology and Soils; • Air Quality; and • Climate Change.

³⁷ Listed Buildings and Unlisted Properties in Conservation Areas Supplementary Guidance SG12 (April 2021), Falkirk Council <https://www.falkirk.gov.uk/media/d3671d56-bbad-4a8e-9c9d-6f50cfe14d2a>

NLLDP2 Policy	Summary	Relevant EIA Topics
PROT B: Historic Environment Assets	PROT B aims to protect World Heritage Sites (Antonine Wall), Scheduled Monuments, Listed Buildings, Conservation Areas and Historic Landscapes.	• Cultural Heritage and Archaeology; and • Landscape and Visual.
EDQ 1: Site Appraisal	EDQ 1 requires a detailed assessment of proposed developments, considering integration with the landscape, public utilities, biodiversity, flood risk, and historic environment.	• Ecology and Biodiversity; • Cultural Heritage and Archaeology; • Landscape and Visual; • Water Environment; • Geology and Soils; • Traffic and Transport; • Noise and Vibration; • Land Use, Recreation and Socio-Economics; • Air Quality; • Climate Change; and • Human Health.
EDQ 2: Specific Features for Consideration	EDQ 2 states that development in areas with hazardous zones, utilities infrastructure, and environmental constraints must be assessed based on risk, contamination, and mitigation measures. Proposed development should be assessed in terms of constraints such as ground stability, flood risk and air quality impacts.	• Water Environment; • Geology and Soils; • Air Quality; and • Human Health.

The following Supplementary Guidance is also considered relevant to the Project:

- SPG 01: Landscaping³⁸;
- SPG 01A: Landscaping Supplement³⁹;
- SPG 02: Trees and Development⁴⁰;
- SPG 09: Flooding and Drainage⁴¹;
- SPG 20: Biodiversity⁴²;
- SPG 20: Biodiversity Appendix⁴³;
- SPG 22: Environmental Impact Assessment EIA⁴⁴; and,
- SPG31: Conservation Areas⁴⁵.

³⁸ Supplementary Planning Guidance 01 Landscaping (2009), North Lanarkshire Council

https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/01%20Landscaping_0.pdf

³⁹ Supplementary Planning Guidance 01A Landscaping Supplement (2009), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/01A%20Landscaping%20supplement.pdf>

⁴⁰ Supplementary Planning Guidance 02 Trees and Development (2012), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/02%20Trees%20and%20Development.pdf>

⁴¹ Supplementary Planning Guidance 09 Flooding and Drainage (2010), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/09%20Flooding%20and%20Drainage.pdf>

⁴² Supplementary Planning Guidance 20 Biodiversity and Development (2011), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/20%20Biodiversity.pdf>

⁴³ Supplementary Planning Guidance 20 Biodiversity and Development Appendix (2011), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/20%20Biodiversity%20Appendix.pdf>

⁴⁴ Supplementary Planning Guidance 22 Environmental Impact Assessment (2011), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/22%20Environmental%20Impact%20Assessment%20EIA.pdf>

⁴⁵ Supplementary Planning Guidance 31 Conservation Areas (2012), North Lanarkshire Council

<https://www.northlanarkshire.gov.uk/sites/default/files/2020-09/31%20Conservation%20Areas.pdf>

05.

Landscape and Visual

5. Landscape and Visual

5.1 Introduction

The Landscape and Visual Impact Assessment (LVIA) will assess the effects of the Project on the landscape character and visual amenity of the immediate and surrounding area.

Landscape and visual effects are interrelated with other environmental effects but will be assessed separately. Landscape effects associated with a development relate to the changes to the fabric, character, and quality of the landscape and how it is experienced. Visual effects relate closely to changes to the landscape, but concern changes in people's views as a result of the introduction of the Project.

This chapter is supported by the following Figures (see Appendix A):

- Figure 5.1: Landscape Designations;
- Figure 5.2: Landscape Character Types; and
- Figure 5.3: Zone of Theoretical Visibility and Representative Viewpoints

Various technical terms are used throughout this chapter, which are defined below:

- Landscape Character Type (LCT): areas of relatively homogenous landscape which are defined by a combination of physical and cultural elements including landform, hydrology, vegetation, land cover, land use pattern, cultural and historic features which combine to create a common 'sense of place' and identity;
- Zone of Theoretical Visibility (ZTV): a digitally produced map showing areas of land within which the Grid Connection will theoretically be visible; and
- Visual receptors: people who will experience views of the Project. Potential visual receptors have been identified through desk study and initial site visits during the earlier routeing stage of work.

Scope of Assessment

The Project comprises three main components which have varying potential to give rise to potentially significant landscape and visual effects. The following section provides the rationale for excluding certain Project components from the LVIA.

The New-build Overhead Line

The New-build Overhead Line (OHL) including the removal of 11km of existing 132kV OHL (CB route), undergrounding of two sections of existing 132kV OHL (AA route) and the connections into Bonnybridge and Cumbernauld substations will be scoped into the LVIA.

Upgrading Existing Overhead Lines

The upgrading of the existing OHLs (ZG, XX and XR routes) from 275 to 400kV will be scoped out of the LVIA as the construction and operational effects associated with these works are not considered to give rise to potentially significant landscape and visual effects. This is due to

the majority of potential impacts on landscape character and visual amenity being temporary in nature and of a short duration, related to construction operations. There is the potential requirement for removal of trees to create a wider wayleave corridor along some of the OHL routes and for localised track improvements to facilitate access, with the potential to result in longer term or permanent change. However, it is anticipated that these aspects would be limited and very localised, or temporary and reversible. As such, these aspects would have little or no influence on the character of the landscape or nature of views.

Substation Works

As part of the Project works are required at a number of existing substations to facilitate the increase in operating voltage to 400kV. The following substation extensions will be scoped out of the LVIA:

- Denny North Substation – works will be limited to the northern side of the existing substation with the installation of a new bay and an OHL gantry tower along with an extension to the existing security fence. These works would be seen within the context of the existing substation and consequently it is considered that they would not give rise to potentially significant landscape and visual effects;
- Easterhouse Substation - works will be limited to an extension to the southeast of the existing substation with the installation of new electrical equipment within the existing compound and fenced area. These works would be seen within the context of the existing substation and consequently it is considered that they would not give rise to potentially significant landscape and visual effects; and
- Wishaw Substation - works will be limited to the installation of new electrical equipment and an extension to the platform and security fence. These works would be seen within the context of the existing substation and consequently it is considered that they would not give rise to potentially significant landscape and visual effects.

The following substation extensions will be scoped into the LVIA:

- Bonnybridge Substation – works will be limited to an extension to the southwest of the existing substation with the installation of new electrical equipment and an extension to the platform and security fence. These works would be seen within the context of the existing substation and consequently it is considered that they would not give rise to potentially significant landscape and visual effects. However, given that the New-build Overhead Line will connect into Bonnybridge Substation, it is considered appropriate that the substation extension works are included as part of the LVIA; and
- Cumbernauld Substation - works are limited to an extension to the south of the existing substation with the installation of new electrical equipment and an extension to the platform requiring earthwork remodelling and security fence. These works would be seen within the context of the existing substation and consequently it is considered that they would not give rise to potentially significant landscape and visual effects. However, given that the New-build Overhead Line will have a spur connecting to Cumbernauld Substation, it is considered appropriate that the substation extension works are included as part of the LVIA.

5.2 Relevant Legislation, Policy and Guidance

Legislation and policy relevant to the Project are set out in Chapter 4. The LVIA will consider relevant national and local policies as necessary and the assessment will be carried out in accordance with the following good practice guidance documents:

- The Landscape Institute and Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition⁴⁶;
- Landscape Institute (2019) Technical Guidance Note 06/19, Visual Representation of Development Proposals⁴⁷; and
- Landscape Institute (2021) Technical Guidance Note 02/21, Assessing landscape value outside national designations⁴⁸.

5.3 Baseline Conditions

An initial study of the baseline environment has been carried out to gain an understanding of the landscape and visual resource of the area to inform the routeing and options appraisal process. Further reviews and analysis will be undertaken as part of the LVIA, informed by a range of resources and publications, including:

- Ordnance Survey (OS) mapping and aerial photography;
- OS Digital Terrain model;
- Landscape Character Type descriptions published by NatureScot;
- Landscape designation descriptions and citations; and
- Relevant local and national planning policy documents.

This desk-based research will be combined with site survey to establish the character of the existing landscape and the nature of existing views in order to define the baseline against which potential change will be assessed. The baseline section of the LVIA will provide a description of the identified landscape and visual receptors, indicating their key characteristics and value.

Study Area

An initial Study Area of 2km either side of the New-build Overhead Line, has been identified for the landscape and visual assessment. The extent of the Study Area has been informed by initial desk and site-based review, analysis of the ZTV diagram (Figure 5.3 in Appendix A), aerial photography and mapping, with application of professional judgement. The Study Area extent will be reviewed and refined during the assessment processes where appropriate, to ensure the assessment is focused on potential significant landscape and visual effects.

Zone of Theoretical Visibility

Initial ZTV mapping has been undertaken to establish the theoretical extent of visibility of the New-build Overhead Line within the wider landscape. This is based on an indicative

⁴⁶ Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition (2013), The Landscape Institute and Institute of Environmental Management and Assessment.

⁴⁷ Visual Representation of Development Proposals, Technical Guidance Note 06/19 (2019), Landscape Institute

⁴⁸ Technical Guidance Note 02/21, Assessing landscape value outside national designations (2021), Landscape Institute.

alignment through the middle of the Preferred Route Option as described in Chapter 2 Project Description. The ZTV has been used to inform the extent of the Study Area and the identification of landscape and visual receptors and uses the following data:

- Digital terrain model (DTM) generated using OS Terrain 5 DTM;
- Existing buildings have been incorporated into the DTM from OS Open Map Local, based on an assumed building height of 7.5m; and
- Woodland from the National Forest Inventory (NFI) has also been incorporated into the DTM, based on an assumed woodland height of 10 m.

The ZTV maps indicate areas from where it may be possible to view the proposed New-build Overhead Line. It should be considered as a tool to assist in assessing the theoretical visibility of the New-build Overhead Line and not a measure of the visual effect. The use of these maps needs to be qualified by the following considerations:

- The ZTV is limited by the detail of the digital terrain model data used and does not take account of local topographic variations;
- The ZTV has been calculated based on a maximum tower height of 63m;
- Some areas of theoretical visibility may comprise woodland (not accounted for in the NFI), moorland or agricultural land, which don't tend to be visited, and the likelihood of views being experienced is consequently low; and
- The ZTV maps do not take account of the likely orientation of a viewer, such as the direction of travel and there is no allowance for reduction of visibility with distance, weather, or light.

Further ZTV analysis will also be undertaken as part of the LVIA in parallel with the iterative design process to identify and refine the final alignment of the Project.

Overview of the New-build Overhead line

The landscape character of the New-build Overhead line Study Area is variable, with a series of large-scale open plateau moorland and forestry, interspersed with smaller scale rolling agricultural and settled lowlands. There is also a strong influence of former mineral workings and development throughout the Study Area and particularly in the south towards Airdrie.

It is a relatively well settled landscape, with a mix of larger towns (Falkirk and Bonnybridge, Cumbernauld and Airdrie) along the fringes of the Study Area, numerous small villages (Slamannan, Greengairs and Glenmavis) and a range of scattered farms and individual houses throughout. There is generally a greater concentration of settlement within the north, west and south of the Study Area, with the central and eastern areas generally more sparsely settled and limited to individual properties or small clusters of properties.

There is an extensive network of roads throughout the Study Area, including the A73 and A803. These principal routes are interconnected by a range of local and minor roads leading to scattered farms and individual properties as well as a network of numerous core paths. The Forth and Clyde and Union canals traverse the Study Area from east to west along with two railway lines.

Existing electrical infrastructure is also an existing feature throughout the Study Area and includes OHLs between Bonnybridge and Cumbernauld in the west, Bonnybridge and Bathgate in the east and the Easterhouse to Newarthill OHL in the south along with a series of smaller wood pole lines which cross parts of the Study Area.

Landscape Designations

Information about areas which contribute to the value of the landscape can be recognised by statute and / or in local plans. Information on these areas and their status forms a landscape designation. The routeing and option appraisal process has ensured that the Project is not within any recognised landscape designation. However, the following two landscape designations are found within or near the Study Area, and as such will be considered in the assessment:

- The Slamannan Plateau / Avon Valley Special Landscape Area (SLA) to the west of the Study Area, and
- Palacerigg Country Park within the Study Area.

The locations of the landscape designations are shown on Figure 5.1 (see Appendix A).

Landscape Character Type

Landscape character can be considered at a range of scales and levels of detail. The landscape assessment for the Project will be based on the LCTs defined and described by NatureScot⁴⁹, although reference will also be made to local landscape character studies where relevant. The LCTs found within the Study Area and immediate context are shown on Figure 5.2 (Appendix A) and briefly described below. In addition, parts of the Study Area are of urban character, where the existing nature of the landscape limits the potential for significant effects.

LCT 151 Lowland Plateaux⁴⁹

The Lowland Plateaux LCT covers an area of gently rolling, open and more elevated land within the Study Area. There are open views to the Forth carselands and rolling plateau landscape which is dissected by scattered farmsteads, minor roads and small river courses. The remnants of open-cast mining can be found within this LCT, specifically to the South of the Slamannan plateau. Recent expansion and development can also be seen in this area with surrounding woodland. Coniferous forestry exists in medium and large blocks with semi-improved grassland cover and open moorland dominating the landcover type. This LCT is crossed by a network of B roads, farm tracks and minor roads.

LCT 152 Lowland River Valleys⁴⁹

The Lowland River Valleys LCT covers an area of urban fringe along Falkirk / Denny in the northern section and transitions to a relatively flat open valley further south. This LCT is of a varying scale and character with road corridors running parallel to river corridors, visibility of derelict land, motorways, wind farms, road corridors coupled with pockets of dense

⁴⁹ Scottish Landscape Character Types and Descriptions [online resources] (2019), NatureScot
<https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions>

coniferous forest cover in the Upper Carron Valley. There is a relatively high proportion of tree, hedgerow and semi-natural woodland cover scattered across this LCT.

LCT 201 Plateau Farmland⁴⁹

The Plateau Farmland LCT covers a band of lower slopes, largely towards the west and south of the Study Area, acting as a transition between the extensive area of plateau moorland to the north and the river valleys and urban areas further to the west and south. This is an open, exposed and large-scale landscape defined by an undulating landform and predominant agricultural land use. Settlement is variable with scattered farms in the east and a number of small and larger settlements to the west where this landscape transitions to urban character. Roads, rail and notable electrical infrastructure also have an influence on the impression of this landscape.

LCT 203 Urban Fringe Farmland⁴⁹

The Urban Fringe Farmland LCT covers an area of varied land pattern and consists of a number of major transport routes to include the A8 / M8, M80 and A71. Pockets of agricultural land / urban fringe farmland are scattered across this LCT and landform varies with undulating farmland present. Fragmented farmland also exists to the north of Easterhouse alongside areas of land formerly used for open-cast mining. This landscape contains many dis-used railway lines due to its former industrial use associated with coal mining and scrub vegetation is found within these areas. Roads, rail and electrical infrastructure have an influence on the impression of this landscape. Typical settlement patterns include scattered farmsteads enclosed by industrial developments and housing developments.

LCT 213 Plateau Moorlands⁴⁹

The Plateau Moorlands LCT covers an area to the southeast of the Study Area. The overall character of this LCT consists of undulating hills, sloping ridges distinctive upland character and more large-scale landform. There is an existing presence of wind turbines and wind farms and a lack of modern development. The settlement of Greengairs is captured within this LCT with surrounding farmland visible.

Visual Amenity

The visual assessment will determine the degree of anticipated change to visual amenity experienced by people (visual receptor) that would occur as a result of the Project, considering views from dwellings, areas of public open space, roads, and footpaths. The visual assessment considers static and sequential effects through analysis of individual viewpoints, considered representative of the range of views within the study area.

Representative viewpoints have been provisionally selected to represent views from a range of different types of visual receptor. At each of the agreed viewpoint location, the following factors which influence the assessment of visual effects will be considered:

- Receptor type (dwelling / road / footpath / open space etc.) and relative numbers of people likely to be affected;
- Relative elevation to the Project;
- Existing views (composition, quality, visual characteristics- nature and extent of skyline, aspects of visual scale and proportion and key foci);

- Distance of viewpoint to nearest point of the Project; and
- Type and nature of view (foreground / midground / background / direct / oblique / screened / partial screening);

Potential visual receptors likely to experience views of the Project include:

- Residential receptors;
- Scattered residential receptors within the study area;
- Recreational users of the various long distance trails and core paths;
- Visitors at the various scenic vantage points; and
- Road users travelling along the network of roads throughout the study area.

Representative viewpoints

Table 5-1 provides a list of eleven representative viewpoints and the receptor groups covered in the LVIA. These viewpoints have been selected based on a desktop study, analysis of the ZTV's and targeted site work. They have been selected to provide a representative range of viewing distance and viewing experience of the scoped elements of the Project (both during construction and operation) and will be agreed with NatureScot and relevant planning authorities. These viewpoints are shown on Figure 5.3 (Appendix A).

Table 5-1 Representative Viewpoints

Viewpoint Number	Location / Description	Reasons for Selection
VP1	A803 Falkirk Road Easting: 283424, Northing: 680665	Representative of views from residential receptors from eastern edge of Bonnybridge and road receptors along A803.
VP2	Bridge over Forth and Clyde Canal Easting: 285311, Northing: 680246	Representative of recreational receptors along the core path network (route 001/61/1).
VP3	Falkirk Wheel Easting: 285290, Northing: 680093	Representative of recreational receptors at the Falkirk Wheel and on the core path network (route 001/15/1).
VP4	Rough Castle Roman Fort Easting: 284169, Northing: 679885	Representative of views from recreational users along the Antonine Wall within the World Heritage Site at Rough Castle Roman Fort and the core path network (route 013/399/1).

Viewpoint Number	Location / Description	Reasons for Selection
VP5	Core Path off Beam Road Easting: 283632, Northing: 678520	Representative of views from recreational users along core path network (route 013/384/1) and residential receptors in scattered properties.
VP6	Core Path along Arns Road Easting: 281067, Northing: 675545	Representative of views from recreational users along core path network (NL/131/1), residential receptors in scattered properties and road users along Arns Road.
VP7	Core Path east of Cumbernauld Easting: 278386, Northing: 674438	Representative of views from recreational users along core path network (NL/136/1).
VP8	Palacerigg Golf Course and Country Park Easting: 278565, Northing: 673569	Representative of views from recreational users of Palacerigg Country Park.
VP9	Greengairs Easting: 279002, Northing: 670850	Representative of views from nearby residential receptors with Greengairs, users of the core path network and road users along the local road network.
VP10	Brackenhirst Road Easting: 276212, Northing: 670011	Representative of residential receptors along Brackenhirst Road and road users along Brackenhirst Road.
VP11	New build residential development Easting: 275545, Northing: 668278	Representative of views from residential receptors on the edge of Glenmavis.

Visualisations

Visualisations will be prepared in accordance with the following guidance:

- Landscape Institute (2019) Technical Guidance Note 06/19, Visual Representation of Development Proposals⁴⁷.

Baseline photography will be undertaken from all of the proposed viewpoints along with photomontages at Project operation reflecting a single season (winter or summer). Visualisations will be accompanied with a technical visualisation methodology.

5.4 Identification of Potential Effects

Potential significant effects on landscape and visual amenity which will be considered include the following:

Construction

Landscape Character

- Temporary physical effects on the landscape fabric as a result of the construction plant and activities associated with the Project;
- Temporary effects on the physical fabric, perceptual aspects or setting of landscape designations including the Slamannan Plateau / Avon Valley SLA;
- Temporary effects on the perceptual aspects of the LCTs within the study area as a result of the construction operations.

Visual Amenity

- Temporary disruption to views for residential and recreational receptors and road users due to construction plant and activities associated with the Project including compounds, access tracks and lighting.

Operation

Landscape Character

- Long term effects on the physical landscape fabric, including loss of landscape elements together with landform changes due to the introduction of the Project;
- Long term effects on the physical fabric, perceptual aspects or setting of landscape designations including the Slamannan Plateau / Avon Valley SLA; and
- Long term effects on the perceptual aspects of the LCTs within the study area as a result of the Project.

Visual Amenity

- Long term changes to views for residential and recreational receptors and road users due to the introduction of the Project.

5.5 Assessment Methods

Proposed Methodology

The LVIA will be undertaken in accordance with GLVIA and other current good practice guidance. The landscape assessment will consider potential effects on recognised LCTs and landscape designations. The visual assessment will be based on a series of representative viewpoint locations informed by detailed baseline study and selected in consultation with statutory consultees. The LVIA will also consider the potential for cumulative effects during the operation phase, resulting from the addition of the Project in relation to other similar

developments. Where appropriate, mitigation measures will be developed and informed by the detailed baseline and assessment stages and will seek to minimise potential adverse effects.

5.6 Summary of Proposed Scope

The scope of the LVIA will comprise the New-build Overhead line including the removal of 11km of existing 132kV OHL (CB route), undergrounding of two sections of existing 132kV OHL (AA route) and the connections into Bonnybridge and Cumbernauld substations, including their associated extensions. All other aspects of the Project will be scoped out of the LVIA.

Table 5-2 provides a summary of the Project Components where LVIA is scoped in, in relation to Construction and Operational phases.

Table 5-2 Summary of Proposed Scope – inclusion of LVIA Topic within EIARs

Project Component	Phase	LVIA Topic Scoped in / out	Rationale (only where topic is scoped out)
New-build overhead line	Construction	Scoped in	Construction impacts on landscape character and visual amenity would be temporary and of a short duration. Potential removal of trees to create a wider wayleave could result in longer term or permanent change. However, it is anticipated these aspects would be limited and very localised, or temporary and reversible.
	Operation	Scoped in	
Upgraded overhead line (ZG Route)	Construction	Scoped out	
	Operation		
Upgraded overhead line (XX Route)	Construction		
	Operation		
Upgraded overhead line (XR Route)	Construction		
	Operation		
CB Route Removal and AA Route Ungrounding	Construction	Scoped in	
	Operation	Scoped in	
Denny North Substation	Construction	Scoped out	Temporary works and new infrastructure would be seen within the context of the existing substation, and it is considered they would not give rise to potentially significant effects.
	Operation	Scoped out	
Bonnybridge Substation	Construction	Scoped in	
	Operation	Scoped in	
Cumbernauld Substation	Construction	Scoped in	
	Operation	Scoped in	
Easterhouse Substation	Construction	Scoped out	

Project Component	Phase	LVIA Topic Scoped in / out	Rationale (only where topic is scoped out)
	Operation	Scoped out	Temporary works and new infrastructure would be seen within the context of the existing substation, and it is considered they would not give rise to potentially significant effects.
Wishaw Substation	Construction	Scoped out	Temporary works and new infrastructure would be seen within the context of the existing substation, and it is considered they would not give rise to potentially significant effects.
	Operation	Scoped out	

06.

Cultural Heritage and Archaeology

6. Cultural Heritage and Archaeology

6.1 Introduction

This EIA scoping chapter sets out the proposed scope and methodology for the assessment of effects of the Project on cultural heritage. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Project.

Cultural heritage in this context refers to the above and below-ground archaeological resource, built heritage, the historic landscape, and any other elements which may contribute to the historical and cultural heritage of the area. The aim of this chapter is to:

- Describe the cultural heritage assets within the Study Area and the surrounding vicinity;
- Identify the potential cultural heritage issues that may arise as a result of the Project; and
- Outline the methods and assessment to be undertaken for inclusion within the EIAR.

The Project comprises three main components, namely the uprating of existing overhead lines from 275 to 400kV, the construction of a new 400kV overhead line as well as works at five existing substations. There are additional ancillary works including the removal of an existing 132kV overhead line as well as partial undergrounding of another.

For the uprating of the existing overhead lines, potential impacts to cultural heritage are expected to be limited. To facilitate the replacement of the conductors (wires), temporary access and working areas will be required which could involve a level of ground disturbance, and other physical impacts would depend on the extent of works required e.g. foundation remedial works or strengthening for existing towers. Setting impacts are not expected on the basis that there would be no discernible change to the existing towers. The full scope of works is set out in Chapter 2.

For the construction of the new 400kV overhead line, potential impacts to cultural heritage are expected to be physical impacts resulting from foundation works for the new towers, stripping linked to temporary access tracks and compounds, as well as permanent impacts on the significance of assets through changes to setting during construction works.

For the works at the five existing substations, potential impacts to cultural heritage are expected to be physical impacts on unknown archaeological remains due to construction of substation platform extensions and associated security fencing, temporary construction compounds or other works areas, and temporary impacts on the significance of assets through changes to setting during construction works.

For the additional ancillary works including the removal of an existing 132kV overhead line as well as undergrounding of another 132kV overhead line, potential impacts to cultural heritage are expected to be physical impacts resulting from the removal of towers and their foundations.

6.2 Relevant Legislation, Policy and Guidance

The assessment will be conducted within the context of the legislative and planning framework designed to protect and conserve heritage resources. There are several statutory instruments and policies governing the approach to cultural heritage. The main pieces of legislation are:

- Town and Country Planning (Scotland) Act 1997 (as amended by the Planning (Scotland) Act 2019)⁵⁰;
- The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (as amended by the Town and Country Planning (Historic Environment Scotland) Amendment Regulations 2015)⁵¹;
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997⁵²;
- Ancient Monuments and Archaeological Areas Act 1979⁵³; and
- Historic Environment Scotland Act 2014⁵⁴.

National Planning Policy

The principal elements of national policy and guidance comprise:

- NPF4⁵⁵;
- Historic Environment Policy for Scotland (HEPS)⁵⁶;
- Our Past, Our Future - The Strategy for Scotland's Historic Environment⁵⁷;
- Planning Advice Note (PAN) 2/2011 – Planning and Archaeology⁵⁸;
- PAN 71 – Conservation Area Management⁵⁹; and
- The Historic Environment Scotland 'Managing Change in the Historic Environment' series of guidance notes (particularly *Managing Change in the Historic Environment: Setting*)⁶⁰.

⁵⁰ Town and Country Planning Act (1997), Scottish Government <https://www.legislation.gov.uk/ukpga/1997/8/contents>

⁵¹ The Town and Country Planning (Development Management Procedure) (Scotland) Regulations (2013), Scottish Government <https://www.legislation.gov.uk/ssi/2013/155/contents>

⁵² Planning (Listed Buildings and Conservation Areas) (Scotland) Act (1997), Scottish Government <https://www.legislation.gov.uk/ukpga/1990/9/contents>

⁵³ Ancient Monuments and Archaeological Areas Act (1979) UK Government <https://www.legislation.gov.uk/ukpga/1979/46/contents>

⁵⁴ Historic Environment Scotland Act (2014), HES <https://www.legislation.gov.uk/asp/2014/19/contents>

⁵⁵ National Planning Framework 4 (2023), Scottish Government <https://www.gov.scot/publications/national-planning-framework-4/documents/>

⁵⁶ Historic Environment Policy for Scotland (2019), Historic Scotland <https://www.historicenvironment.scot/advice-and-support/planning-and-guidance/historic-environment-policy-for-scotland-heps/>

⁵⁷ Our Past, Our Future (2023), HES <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=79204155-9eb2-4d29-ab14-aff200ec2801>

⁵⁸ Planning Advice Note 2/11 – Planning and Archaeology (2011), Scottish Government <https://www.gov.scot/publications/pan-2-2011-planning-archaeology/>

⁵⁹ Planning Advice Note 71 – Conservation Area Management (2004), Scottish Government <https://www.gov.scot/publications/conservation-management-planning-advice/>

⁶⁰ Managing Change in the Historic Environment (2016), HES <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=80b7c0a0-584b-4625-b1fd-a60b009c2549>

Local Planning Policy

The Falkirk LDP 2 was adopted in 2020⁶¹. The following policies within the LDP relevant to this chapter are as follows:

- Policy PE05 Antonine Wall;
- Policy PE06 Archaeological Sites;
- Policy PE07 Listed Buildings;
- Policy PE08 Conservation Areas;
- Policy PE09 Areas of Townscape Value;
- Policy PE10 Historic Gardens and Designed Landscapes; and
- Policy PE11 Battlefield Sites;
- Policy PE12 Canals.

The North Lanarkshire LDP was adopted in 2022⁶². The following policies within the LDP relevant to this chapter are as follows:

- PROT B Policy Historic Environment Assets.

Guidance

The assessment has been undertaken following the Chartered Institute for Archaeologists (CIfA) Standards and Guidance for Historic Environment Desk-Based Assessment⁶³ and the United Nations Educational, Scientific and Cultural Organization (UNESCO) Guidance Toolkit for Impact Assessments in a World Heritage Context⁶⁴.

6.3 Baseline Conditions and Study Area

The Study Area is the area within which cultural heritage assets may experience effects as a result of the Project. Effects to heritage assets may arise during construction or operation. Effects to heritage assets may arise as a result of physical impacts to their fabric or through impacts upon the significance of assets through changes to their setting. For clarity, the Study Areas for the different components of the Project are outlined below.

Up-rated Overhead Lines (ZG, XX and XR)

For the purpose of this Scoping Report, a Study Area for the up-rated overhead lines has been defined as 250m from the Scoping Boundary. This has been used to provide baseline information for the assessment. The potential for permanent significant impacts on the setting of heritage assets are not predicted due to the nature of the upgrade (i.e. there will be no significant alterations to the existing towers of the ZG, XX and XR OHLs).

⁶¹ Falkirk Local Development Plan (2020), Falkirk Council <https://www.falkirk.gov.uk/development-planning/falkirk-local-development-plan-2>

⁶² North Lanarkshire Local Development Plan (2022), North Lanarkshire Council <https://www.northlanarkshire.gov.uk/planning-and-building/development-plans/current-north-lanarkshire-local-development-plan>

⁶³ Standard and guidance for historic environment desk-based assessment (2020), CIfA <https://www.ashford.gov.uk/media/e10b44ux/5-4-cifa-standards-and-guidance.pdf>

⁶⁴ Guidance Toolkit for Impact Assessments in a World Heritage Context (2022), UNESCO <https://unesdoc.unesco.org/ark:/48223/pf0000382347>

Removal of CB Route

For the purpose of this Scoping Report, a Study Area for the removal of CB route has been defined as 250m from the Scoping Boundary. This was used to provide baseline information for the assessment. A wider Study Area has been used to identify designated assets where there is the potential for changes to their setting. The Study Area for the assessment of setting was limited to 500m.

Undergrounding of AA Route

For the purpose of this Scoping Report, a Study Area of 250m has been defined from the localised undergrounding of AA route where it crosses the New Build Overhead Line in two locations. This has been used to provide baseline information for the assessment. A wider Study Area was used to identify designated assets where there is the potential for changes to their setting. The Study Area for the assessment of setting was limited to 500m, again from where the AA route is undergrounded where it crosses the New Build Overhead Line in the same two locations.

Substations (Denny North, Bonnybridge, Cumbernauld, Easterhouse and Wishaw)

For the purpose of this Scoping Report, Study Areas for the substations at Denny North, Bonnybridge, Cumbernauld, Easterhouse and Wishaw have been defined as 250m from the Scoping Boundary. These were used to provide baseline information for the Scoping assessment. A wider Study Area was used to identify designated assets where there is the potential for changes to their setting. The Study Area for the assessment of setting was limited to 500m.

New-Build Overhead Line

For the purpose of this Scoping Report, the Study Area for the New-build Overhead Line has been defined as 500m from the Scoping Boundary for all designated and non-designated heritage assets. For higher graded heritage assets (i.e. World Heritage Sites, Category A listed buildings, registered battlefields, Registered Parks and Gardens (RPG) and scheduled monuments) the Study Area has been extended to 2km from the Scoping Boundary. This is in recognition that high value heritage assets have a higher sensitivity to change and greater potential for their settings to extend over a larger area as the New-build Overhead Line comprises steel towers up to 63m tall which may result in impacts over wider area compared to other components of the Project which are unlikely to have setting impacts or where setting impacts are more localised.

Baseline Conditions

As part of this scoping exercise, a high-level search of relevant data has been undertaken, with material collected from online sources for the Scoping Boundary utilising the Study Areas the designated and non-designated assets in the different components of the Project as discussed in section 6.3. These sources include:

- Canmore National Record of the Historic Environment website⁶⁵;
- PastMap⁶⁶;

⁶⁵ Canmore National Record of the Historic Environment (n.d.), Historic Environment Scotland <https://canmore.org.uk/>

⁶⁶ PastMap (n.d.), Historic Environment Scotland <https://www.pastmap.org.uk/>

- Historic Environment Scotland (HES) website⁶⁷;
- Historic mapping on the National Library of Scotland website (Map images - National Library of Scotland⁶⁸; and
- Other available online sources.

All assets are listed in the gazetteer provided in Appendix B, and are shown in Appendix A, Figure 6-1 and Figure 6-2. Assets are referred to in the text by their HES number, with the SM prefix signifying scheduled monuments, while the LB prefix signifies a listed building. Non-designated assets from the CANMORE database have the prefix 'CANMORE'.

Consultation

Initial consultation has taken place with HES in 2020 and 2024 as part of routeing study which informed the identification of the New-build Overhead Line. This focused on the potential crossing of the World Heritage Site at Rough Castle (SM90013) which forms part of the Antonine Wall Frontiers of Roman Empire WHS.

Land Use and Topography

New-build Overhead Line, Removal of CB Route and Undergrounding of AA Route

The removal of the existing 132kV overhead line between Bonnybridge and Cumbernauld Substations ('CB route') would be on the same or a similar alignment to the New-build Overhead Line.

The New-build Overhead Line route starts on the western side of Bonnybridge Substation within Falkirk. It is routed to the south of the substation crossing two existing 132kV overhead lines routes, referred to as CB route and AA route, then heads southeast towards the Forth and Clyde Canal. The landscape predominantly comprises of arable fields interspersed with areas of woodland. This section of the New-build Overhead Line is located within the Antonine Wall Frontiers of the Roman Empire WHS Buffer Zone. From here, the New-build Overhead Line crosses the Canal, Antonine Wall and railway lines in southern direction to Howie Rig. It then heads south-west largely following the existing CB route to the north / north-west of the Slamannan Plateau SPA. The terrain becomes rougher along with more expansive woodland. The New-build Overhead Line crosses into North Lanarkshire to the north of Fannyside Muir continuing towards Palacerigg Country Park. The terrain here comprises expansive moorland. The New-build Overhead Line includes an approximate 750m spur which connects it to the existing Cumbernauld Substation and allows the existing CB route between Bonnybridge and Cumbernauld to be removed in its entirety. From Cumbernauld Substation the New-build Overhead Line is routed through part of Palacerigg Country Park heading south towards Greengairs. The landscape here comprises relatively rough pastoral fields interspersed with woodland and boggy terrain. It is routed south-west from here crossing the A73 to the north of Riggend. From here the route heads south to the west of Stand where it meets the reconfigured XX route. A new tee-shape arrangement would be formed to the northwest of Glenmavis with the XX route diverted to form a dogleg which would continue south over the B803 before connecting to the existing XX route to the west of the Albert Bartlett Factory.

⁶⁷ Historic Environment Scotland (n.d.), Historic Environment Scotland <https://www.historicenvironment.scot/>

⁶⁸ Maps (2025), National Library of Scotland <https://maps.nls.uk/>

ZG Route

The ZG route is approximately 4km long extending from Denny North Substation to Bonnybridge Substation. It exits the substation in a southern direction through a wayleave within Tor Wood which is identified on the Ancient Woodland Inventory. The landscape comprises boggy terrain, parts of which are also planted with forestry plantations. The route continues in a south-east direction with pastoral and arable fields more evident, crossing the M876 before heading south crossing the River Carron and A883, terminating at Bonnybridge Substation.

XX Route

The XX route is approximately 15km long extending from Easterhouse Substation to Newarthill Substation. It is routed in an eastern direction from Easterhouse towards Glenmavis. It is routed east / south-east around Glenmavis but as part of the Project will be diverted to tie into the New-build Overhead Line. It continues south to the west of the Albert Bartlett Factory and then is routed to the northeast and east of Airdrie on the margins of the town. The terrain predominantly comprises pastoral farmland. It is routed through the housing estates of Chapelhall before crossing the M8 to the west of Newhouse before terminating at Newarthill Substation.

XR Route

The XR route is approximately 16km extending from Newarthill Substation to Wishaw Substation. It is routed in a broadly eastern direction from Newarthill Substation towards Shotts then heads south between Bonkle and Allanton. The landscape predominantly comprises pastoral farmland until it reaches the vicinity of the Muiredge and Jersey Road where the land becomes boggier, interspersed with rough pasture and forestry plantations. It is then routed in a western / southwestern direction to the south of Wishaw before terminating at Wishaw Substation. The quality of soils improves, and pastoral farmland becomes more predominant.

Heritage Assets

New-build Overhead Line

Designated Assets

There is one WHS, one WHS buffer, five scheduled monuments, one listed building, and one battlefield within the Scoping Boundary.

There is one WHS, one World Heritage Site buffer, 28 scheduled monuments, 77 listed buildings, four conservation areas and one battlefield within the 2km Study Area of the Project.

The New-build Overhead Line will cross the Antonine Wall Frontiers of the Roman Empire WHS (WH1) and the Antonine Wall Frontiers of the Roman Empire WHS buffer (WHB1). The Antonine Wall was the most northerly frontier of the Roman Empire nearly 2,000 years ago. It ran for 60km from the Firth of Forth to the River Clyde. It comprised a turf rampart fronted by a wide and deep ditch. Forts and fortlets along the wall housed the troops stationed at the frontier. A road known as the Military Way ran behind the rampart, linking the forts. There are

two scheduled monuments associated with the Antonine Wall within the Scoping Boundary at this location, the Antonine Wall, Rough Castle to Lime Road, and field system (SM8244) and Antonine Wall, Rough Castle fort, annexe and Military Way (SM90013).

The New-build Overhead Line also crosses the Forth and Clyde Canal: Castlecary - M9 Motorway scheduled monument (SM6768). This is an 18th-century canal, 14.5km in length, and the scheduled area includes the entire length of canal in water, the short stretch of canal immediately west of the M9 Motorway now infilled, together with the banks on either side and the towing path running along one side.

There are a further two scheduled monuments also located within the Scoping Boundary of the New-build Overhead Line, comprising Wester Carmuir, a prehistoric ring ditch settlement 450m south-south-west of Wester Carmuir (SM6413) and a Roman camp 640m south-east of Wester Carmuir (SM3188).

There are a further 23 scheduled monuments outside the Scoping Boundary in the 2km Study Area.

There are prehistoric enclosures 50m east of Wester Carmuir (SM6414) approximately 90m north of the Scoping Boundary, a prehistoric ring ditch 500m north-west of Carmuir West Junction (SM6415) approximately 240m north-east of the Scoping Boundary, a prehistoric enclosure and part of Roman camp 250m south-south-west of Househill (SM6483) approximately 880m north of the Scoping Boundary.

A number of scheduled monuments in the wider 2km Study Area are of Roman date and are associated with the Antonine Wall which are as follows:

- Antonine Wall, 495m west-south-west and 125m south-east of Bonnyside House (SM8207) approximately 410m west of the Scoping Boundary;
- Antonine Wall, Lime Road to Tamfourhill (SM8251) approximately 410m east of the Scoping Boundary;
- Antonine Wall, Roman temporary camp 240m south-east of Milnquarter (SM3242) approximately 790m north-west of the Scoping Boundary;
- Antonine Wall, west and east of Watling Lodge, Tamfourhill (SM90016) approximately 815m east of the Scoping Boundary;
- Antonine Wall, Watling Lodge fortlet, Tamfourhill, Falkirk (SM8453) approximately 840m east of the Scoping Boundary;
- Antonine Wall, 160m east-north-east to 155m north-west of St Joseph's Church (SM12606) approximately 1.1km north-west of the Scoping Boundary;
- Antonine Wall, Seabegs Wood, rampart, ditch and Military Way (SM90014) approximately 1.2km north-west of the Scoping Boundary;
- Antonine Wall and motte, 75m south-west of Antonine Primary School (SM12373) approximately 1.3km north-west of the Scoping Boundary;
- Antonine Wall, 300m north-west of Milnquarter (SM12374) approximately 1.4km north of the Scoping Boundary;

- Antonine Wall, 80m west-south-west of Seabegs Place (SM7744) approximately 1.4km north-west of the Scoping Boundary;
- Antonine Wall, Dalnair to Seabegs Wood, including fortlet and camp (SM7742) approximately 1.6km west of the Scoping Boundary;
- Antonine Wall, 170m north-north-west to 305m north-east of Falkirk High School (SM8828) approximately 1.9km east of the Scoping Boundary;
- Antonine Wall, 80m south-west of Woodhouse Eaves to Underwood Cottage (SM7739) approximately 1.9km north-west of the Scoping Boundary;
- Lochlands Roman camps (SM4259) approximately 430m north-east of the Scoping Boundary;
- Roman temporary camp 200m south-east of Station House (SM6542) approximately 550m east of the Scoping Boundary; and
- Roman forts at Camelon (SM1746) approximately 920m north-east of the Scoping Boundary.

There is one scheduled monument of medieval date in the wider 2km Study Area comprising a motte and burial ground, Hill of Dunipace (SM3420) approximately 430m north of the Scoping Boundary.

There are two scheduled monuments of post-medieval date in the wider 2km Study Area, namely a dovecote and remains of house 200m north-east of Hill of Dunipace (SM5378) approximately 660m north of the Scoping Boundary and the Union Canal, River Avon to Greenbank (SM8952) approximately 1.2km east of the Scoping Boundary.

There is one scheduled monument of modern date in the wider 2km Study Area, comprising an anti-aircraft battery 350m west-south-west of Drumbowie Farm (SM11197) approximately 135m west of the Scoping Boundary. It dates to World War II and is thought to have been modified during the early years of the Cold War.

There is one listed building located within the Scoping Boundary of the New-build Overhead Line, comprising Lochgreen Farmhouse (Category B; LB13326). There are another 76 listed buildings within the wider 2km Study Area for the New-build Overhead Line which include Category A, B and C listed buildings.

The Category A listed buildings in the 2km Study Area comprise the following:

- Sacred Heart Roman Catholic Church And Presbytery, Ellisland Road, Cumbernauld (LB24091) approximately 820m north-west of the Scoping Boundary;
- St Mary's Roman Catholic Church, Glasgow Road, Camelon, Falkirk (LB31252) approximately 1.1km east of the Scoping Boundary;
- Cumbernauld House (LB24086) approximately 1.4km north of the Scoping Boundary; and
- Churchyard With James Bruce and Mary Dundas Monument, Larbert Old Church (LB10496) approximately 1.5km north-east of the Scoping Boundary.

The Category B listed buildings in the 2km Study Area comprise the following:

- Alasdair Gray Mural, Palacerigg Visitor Centre (LB52610) approximately 200m north-east of the Scoping Boundary;
- Stable Block, Rochsoles (LB14205) approximately 310m south-west of the Scoping Boundary;
- Dunipace Bridge, River Carron, Bonnybridge (LB3959) approximately 550m north-west of the Scoping Boundary;
- Parish Church, Condorrat Road, New Monkland (LB19676) approximately 450m south of the Scoping Boundary;
- Watch House, Parish Church, New Monkland (LB14204) approximately 470m south of the Scoping Boundary;
- Braidenhill Farmhouse, Yetts Hole Road, Glenmavis (LB19251) approximately 550m south of the Scoping Boundary;
- Kildrum Parish Church, Clouden Road, Cumbernauld (LB47480) approximately 700m north-west of the Scoping Boundary;
- Craigieburn Farmhouse, Lochgreen Road (LB10523) approximately 890m south-east of the Scoping Boundary;
- Watling Lodge and Stables Including Gatepiers And Garden Steps, Tamfourhill Road (LB50226) approximately 940m east of the Scoping Boundary;
- Larbert House (LB10495) approximately 1.6km north-east of the Scoping Boundary;
- Luggiebank Bridge (LB46705) approximately 1.2km west of the Scoping Boundary;
- Educational Resource Centre, Formerly Chapelside Primary School, including boundary walls, gatepiers, gates and railings, Chapel Street, Airdrie (LB20939) approximately 1.5km south of the Scoping Boundary;
- Stanley Old College Gate, North Biggar Road, Airdrie (LB48556) approximately 1.96 south of the Scoping Boundary;
- Cleddans House (LB14207) approximately 1.23km west of the Scoping Boundary;
- Stables, Cleddans House (LB14208) approximately 1.25 km west of the Scoping Boundary;
- Oakdene, including gatepiers and gate, Tamfourhill Road (LB50225) approximately 1.29km east of the Scoping Boundary;
- Arran View, including gatepiers, 3 Arran Drive, Airdrie (LB20928) approximately 1.45km south of the Scoping Boundary;
- Sundial, Cumbernauld House (LB24087) approximately 1.37km north of the Scoping Boundary;
- Cumbernauld College, including walls and railings, North Carbrain Road, Cumbernauld (LB47482) approximately 1.4km west of the Scoping Boundary;
- Larbert Viaduct (LB10517) approximately 1.44km north-east of the Scoping Boundary;

- Union Inn, Forth and Clyde Canal, 2 Port Downie, Tamfourhill, Falkirk (LB31233) approximately 1.46km east of the Scoping Boundary;
- Obelisk, marking site of Falkirk Battlefield, Bantaskine Estate (LB10521) approximately 1.5km east of the Scoping Boundary;
- Old Manse, Denny Road, Larbert (LB10516) approximately 1.6km north-east of the Scoping Boundary;
- St Margaret's Roman Catholic Church, including presbytery and boundary wall, Hallcraig Street, Airdrie (LB20924) approximately 1.97km south of the Scoping Boundary;
- Doocot, Cumbernauld House (LB24088) approximately 1.57km north-west of the Scoping Boundary;
- Larbert Old Church (LB10515) approximately 1.58km north-east of the Scoping Boundary;
- Airdrie's Children's Board, 16 and 18 North Bridge Street, Airdrie (LB20944) approximately 1.8km south of the Scoping Boundary;
- St Mungo's Church (Church of Scotland), including halls, steel cross, St Mungo's Road, Cumbernauld (LB46977) approximately 1.6km west of the Scoping Boundary;
- Glenboig Farm (LB19250) approximately 1.86km north-west of the Scoping Boundary;
- The Masonic Arms, 62 Main Street, Cumbernauld Village (LB24081) approximately 1.75km north of the Scoping Boundary;
- Cumbernauld Old Parish Church, Baronhill, Cumbernauld Village (LB24068) approximately 1.79km north-west of the Scoping Boundary;
- Millcroft Mill (former corn mill) (LB18438) approximately 1.8km north-west of the Scoping Boundary;
- Fannyside Mill (LB1073) approximately 1.9km south-east of the Scoping Boundary; and
- Woodcroft, Carronvale Road, South Broomage, Larbert (LB13348) approximately 1.9km north-east of the Scoping Boundary.

There are a further 37 Category C listed buildings within the 2km Study Area.

There are four conservation areas in the wider 2km Study Area which comprise the following:

- Drumgelloch (CA382) approximately 1.67km south of the Scoping Boundary;
- Victoria and Town Centre (CA383) approximately 1.7km south of the Scoping Boundary;
- Cumbernauld Village (CA384) approximately 1.5km north-west of the Scoping Boundary; and
- Allandale Cottages (CA551) conservation area in Falkirk approximately 1.99km north-west of the Scoping Boundary.

The battlefield of Falkirk II (BTL9) is located within the wider 2km Study Area, approximately 255m east of the Scoping Boundary. The second battle of Falkirk was the first battle to be fought in Scotland (on 17th January 1746) following the return of the Jacobite army from its unsuccessful invasion of England in 1745.

Non-designated Assets

There are 126 non-designated heritage assets within the 500m Study Area, including Roman, medieval, post-medieval and modern archaeological sites, as well as sites where a period has not been assigned. A Bronze Age axehead findspot is recorded at New Monkland (CANMORE 45757). Non-designated heritage assets from the Roman period are within the environs of the Antonine Wall and include fortlets at Tentfield (CANMORE 46762) and Bonnyside East (CANMORE 376640), a signal platform at Tentfield West (CANMORE 127415) and an altar at Bogton (CANMORE 46937). Non-designated assets from the medieval period include a coin hoard and unidentified pottery at New Monkland (CANMORE 45757) as well as rig and furrow (evidence of plough cultivation) at Lochgreen (CANMORE 286486). Farmsteads, mining sites and structures associated with both the Forth & Clyde Canal and the Union Canal forming the majority of the post-medieval non-designated heritage assets. Non-designated assets from the modern period include Bonnybridge Power Station (CANMORE 105789), a dragon mural in a housing estate on Laburnam Road in Cumbernauld (CANMORE 348769), the Palacerigg Country Park Visitor Centre (CANMORE 374555) and a World War II anti-aircraft battery at Drumbowie (CANMORE 374555).

Removal of CB Route

Designated Assets

There is one WHS, one WHS buffer, 12 scheduled monuments and one listed building within the wider 500m Study Area of the Project.

The following designated heritage assets are located within the Scoping Boundary.

The removal of the CB Route will cross the Antonine Wall Frontiers of the Roman Empire WHS (WH1) and the Antonine Wall Frontiers of the Roman Empire WHS buffer (WHB1). There are two scheduled monuments associated with the Antonine Wall within the Scoping Boundary at this location, the Antonine Wall, Rough Castle to Lime Road, and field system (SM8244) and Antonine Wall, Rough Castle fort, annexe and Military Way (SM90013).

The removal of the CB Route also crosses the Forth and Clyde Canal: Castlecary - M9 Motorway (SM6768).

There are a further two scheduled monuments also located within the Scoping Boundary of the CB Route, comprising a prehistoric ring ditch settlement 450m south-south-west of Wester Carmuir (SM6413) and a Roman camp 640m south-east of Wester Carmuir (SM3188).

There is one listed building located within the Scoping Boundary of the CB Route, comprising Lochgreen Farmhouse (Category B; LB13326).

There are a further four scheduled monuments outside the Scoping Boundary in the wider 500m Study Area.

There are prehistoric enclosures 50m east of Wester Carmuir (SM6414) approximately 90m north of the Scoping Boundary and a prehistoric ring ditch 500m north-west of Carmuir West Junction (SM6415) approximately 240m north-east of the Scoping Boundary.

One scheduled monument in the wider 500m Study Area is of Roman date and associated with the Antonine Wall: the Lochlands Roman camps (SM4259) approximately 430m north-east of the Scoping Boundary.

There is one scheduled monument of medieval date in the wider 500m Study Area comprising a motte and burial ground, Hill of Dunipace (SM3420) approximately 430m north of the Scoping Boundary.

The battlefield of Falkirk II (BTL9) which was fought on 17th January 1746 between a Jacobite army and government forces is located within the wider 500m Study Area approximately 255m east of the Scoping Boundary.

Non-designated Assets

There are 60 non-designated heritage assets within the 250m Study Area, including Roman, post-medieval and modern archaeological sites, as well as sites where a period has not been assigned. Non-designated assets from the Roman period are within the environs of the Antonine Wall Frontiers of the Roman Empire WHS, and as with the New-build Overhead Line, include fortlets at Tentfield (CANMORE 46762) and Bonnyside East (CANMORE 376640), a signal platform at Tentfield West (CANMORE 127415) and an altar at Bogton (CANMORE 46937). A Roman road from Belstane to Castlecary (CANMORE 241939) is projected to have crossed Fannyside Muir, but no trace has ever been found. Non-designated assets from the medieval period comprise rig and furrow (evidence of plough cultivation) at Lochgreen (CANMORE 286486). Farmsteads, mining sites and structures associated with the Forth & Clyde Canal forming the majority of the post-medieval non-designated heritage assets. Non-designated assets from the modern period include Bonnybridge Power Station (CANMORE 105789), a memorial to a labour uprising called the Battle of Bonnymuir (1820) (CANMORE 369820), the Falkirk Millennium Wheel (CANMORE 218994), flats (CANMORE 348771) and a dragon mural in a housing estate (CANMORE 348769) on Laburnam Road in Cumbernauld.

Undergrounding of AA Route

Designated Assets

There is one WHS buffer and two scheduled monuments within 500m of where the AA Route will be undergrounded.

Part of the section of AA route to be undergrounded is within the WHS buffer (WHB1).

There are two scheduled monuments also located within 500m of where the AA route will be undergrounded, comprising a prehistoric ring ditch settlement 450m south-south-west of Wester Carmuir (SM6413) approximately 200m east of the proposed undergrounding and the Forth and Clyde Canal: Castlecary – M9 motorway (SM6768) approximately 20m south of the proposed undergrounding.

Non-Designated Assets

There are two non-designated heritage assets within the 250m of where the AA Route will be undergrounded, comprising canal structures associated with the Forth and Clyde Canal, namely the Rowan Tree Burn Sluice (CANMORE 171288) approximately 60m south-west of the proposed undergrounding and the Rowan Tree Burn Aqueduct (CANMORE 171296) approximately 30m south of the proposed undergrounding.

ZG Route

Designated Assets

There are no designated assets within the scoping boundary.

There is one WHS buffer and three scheduled monuments outside the Scoping Boundary within the 250m Study Area.

The Antonine WHS buffer (WHB1) lies approximately 170m south of the ZG route.

There is a prehistoric enclosure and part of a Roman camp 250m south-south-west of Househill (SM6483) approximately 250m east of the Scoping Boundary.

There is a medieval motte and burial ground on the Hill of Dunipace (SM3420) approximately 60m west of the Scoping Boundary.

There is a single scheduled monument of post-medieval date, namely a dovecote and remains of a house 200m north-east of Hill of Dunipace (SM5378) approximately 10m west of the Scoping Boundary.

Non-designated Assets

There are 13 non-designated heritage assets within the 250m Study Area, including a spread of large oak logs with axe-dressed ends recorded and sampled at Torwood Mire (CANMORE 369726) which were partly dated to the Mesolithic and Neolithic periods. Medieval settlement activity is reflected with the presence of a medieval church and motte (CANMORE 47050) and rig and furrow (evidence of plough cultivation) (CANMORE 47038) at the Hills of Dunipace. Continuity in estate organisation is seen in Dunipace with the presence of an L-shaped house (CANMORE 47014), typical of the 16th and 17th centuries, and a country house (CANMORE 141851) built in the 19th century. Non-designated assets from the modern period include Bonnybridge Power Station (CANMORE 105789).

XX / XR Overhead Line

Designated Assets

There is one listed building located within the Scoping Boundary of the XX / XR overhead line, comprising the Meikle Hareshaw farmhouse (Category B; LB1276).

There are two Category B listed buildings outside the Scoping Boundary of the Project within the 250m Study Area. These comprise the following:

- Chapelhall Parish Church, Russell Street, Chapelhall (LB19659) approximately 200m west of the Scoping Boundary; and
- Wester Moffat House, Clarkston (LB20930) approximately 200m south-west of the Scoping Boundary.

There are a further three Category C listed buildings outside the Scoping Boundary of the Project within the 250m Study Area.

Non-designated Assets

There are 72 non-designated heritage assets within the 250m Study Area, including a findspot comprising chert and flint tools possibly of Mesolithic date (CANMORE 45770) on the north

shore of Woodend Loch, and a possible prehistoric standing stone, the 'Gauk Stone' (CANMORE 46738) on Little Hareshaw Muir. Non-designated assets from the medieval period comprise rig and furrow (CANMORE 86242) at Newark Plantation. Farmsteads like the Foulburn farmstead (CANMORE 287857), mining sites such as the Old Coal Pit (CANMORE 362629) and Thrushbush Pit (CANMORE 362630) at Airdrie, and quarries such as the example at Brownhill (CANMORE 82226) form the majority of the post-medieval non-designated heritage assets. Non-designated assets from the modern period include war memorials at Chapelhall parish church (CANMORE 228003) and on Overtown Road, Waterloo (CANMORE 340635).

Denny North Substation

Designated Assets

There are no designated assets within the Scoping Boundary of the Denny North Substation.

There is one scheduled monument outside the Scoping Boundary of the Project within the 500m Study Area comprising a prehistoric dun (small fort built on a hillock or crag) 700m north of Doghillock (SM6929) approximately 25m south-west of the Scoping Boundary.

Non-designated Assets

There are no non-designated heritage assets recorded within the Scoping Boundary of the Denny North Substation, though there are two non-designated heritage assets within the 250m Study Area. A spread of large oak logs with axe-dressed ends were recorded and sampled at Torwood Mire (CANMORE 369726). Dendrochronological analysis of the oak assemblage produced two floating tree-ring chronologies which were subsequently dated by radiocarbon to the Mesolithic and Neolithic periods, while the wide-bladed metal axe marks on some of the oak logs could date to any time from the Roman Iron Age to the early modern period. A modern quarry called Thorndyke Quarry (CANMORE 22796) is also recorded.

Bonnybridge Substation

Designated Assets

There are no designated heritage assets either within the Scoping Boundary of Bonnybridge Substation. There is one WHS buffer and two scheduled monuments outside the Scoping Boundary of the Project within the 500m Study Area.

The Antonine World Heritage Site buffer (WHB1) lies approximately 85m south of the Bonnybridge Substation.

There is one scheduled monument of prehistoric date comprising a ring ditch settlement 450m south-south-west of Wester Carmuir (SM6413) approximately 480m south-east of the Scoping Boundary.

There is one scheduled monument of post-medieval date comprising the Forth and Clyde Canal: Castlecary - M9 Motorway (SM6768) approximately 380m south of the Scoping Boundary.

Non-designated Assets

There are no non-designated heritage assets recorded within the Scoping Boundary of the Bonnybridge Substation, though there is one non-designated heritage asset (of modern date) within the 250m Study Area. This comprises the Bonnybridge Power Station (CANMORE 105789).

Cumbernauld Substation

Designated Assets

There are no designated heritage assets either within the Scoping Boundary or the wider 500m Study Area.

Non-designated Assets

There are no non-designated heritage assets recorded within the Scoping Boundary of the Cumbernauld Substation, though there are four non-designated heritage assets within the 250m Study Area. There are three non-designated heritage assets of modern date which comprise a block of flats on Laburnam Road (CANMORE 348771), a dragon mural on a housing estate also on Laburnam Road (CANMORE 348769) and Cumbernauld High School on the Kildrum Road (CANMORE 207220). There is a non-designated heritage asset of unknown date which comprises a pond (CANMORE 124445).

Easterhouse Substation

Designated Assets

There are no designated heritage assets either within the Scoping Boundary or the wider 500m Study Area.

Non-designated Assets

There are no non-designated heritage assets recorded within the Scoping Boundary of the Easterhouse Substation, though there are two non-designated heritage assets within the 250m Study Area. There is a non-designated asset of prehistoric date which comprises a finds spot of lithic implements ranging in date from the Upper Palaeolithic, through the Mesolithic and into the Neolithic (CANMORE 45770). There is a non-designated asset of modern date which comprises an 18th-century reservoir known as Woodend Loch. The Monkland Canal was drawing water from this loch by the end of the 18th century (CANMORE 209712).

Wishaw Substation

Designated Assets

There are no designated heritage assets either within the Scoping Boundary or the wider 500m Study Area.

Non-designated Assets

There are no non-designated heritage assets recorded within the Scoping Boundary of the Wishaw Substation, though there is one non-designated heritage assets within the 250m Study Area. The non-designated heritage asset comprises a general view of a complex of flats (CANMORE 70182) immediately to the south of the Wishaw Substation.

Sensitive Receptors

New-build Overhead Line

The New-build Overhead Line will run across the Antonine Wall Frontiers of the Roman Empire WHS (WH1) and the Antonine Wall Frontiers of the Roman Empire WHS buffer (WHB1). The New-build Overhead Line also crosses the Forth and Clyde Canal: Castlecary - M9 Motorway (SM6768).

There are two scheduled monuments associated with the Antonine Wall within close vicinity of the New-build Overhead Line, the Antonine Wall, Rough Castle to Lime Road, and field system (SM8244) and Antonine Wall, Rough Castle fort, annexe and Military Way (SM90013).

There are another two scheduled monuments also located within close vicinity of the New-build Overhead Line, comprising Wester Carmuir, a prehistoric ring ditch settlement 450m south-south-west of Wester Carmuir (SM6413) and a Roman camp 640m south-east of Wester Carmuir (SM3188).

Any works within the boundary of the Antonine Wall Frontiers of the Roman Empire WHS (WH1) and the Antonine Wall Frontiers of the Roman Empire WHS Buffer (WHB1) will require a heritage impact assessment. This will assess the impacts of the Project on the attributes of Outstanding Universal Value of the WHS meeting the requirements of UNESCO guidance⁶⁴.

Any works within the scheduled area of the above-mentioned scheduled monuments will require Scheduled Monument Consent.

There is one listed building located within the Scoping Boundary of the New-build Overhead Line, comprising Lochgreen Farmhouse (Category B; LB13326). There are another 76 listed buildings within the wider 2km Study Area for the New-build Overhead Line which include Category A, B and C listed buildings. Proposed works may impact the setting of these listed buildings.

The battlefield of Falkirk II (BTL9) is located within the wider 2km Study Area, approximately 255m east of the Scoping Boundary. Proposed works may impact the setting of this battlefield.

A number of non-designated heritage asset are located within the Scoping Boundary close to the New-build Overhead Line. A possible Roman fortlet (CANMORE 46762) is located close to a proposed overhead line tower. Another proposed overhead line tower and access track are located in an area of medieval to post-medieval rig and furrow at Lochgreen (CANMORE 286486). An unidentified structure of archaeological significance has been located in Castlecary High Wood (CANMORE 268818) close to a proposed overhead line tower and access track. Any groundworks required for the New-build Overhead Line may physically impact these non-designated heritage assets as well as unknown archaeological remains.

Removal of CB Route

The CB Route runs across the Antonine Wall Frontiers of the Roman Empire WHS (WH1) and the Antonine Wall Frontiers of the Roman Empire WHS buffer (WHB1). The CB Route also crosses the Forth and Clyde Canal: Castlecary - M9 Motorway (SM6768).

There is one scheduled monument associated with the Antonine Wall on the CB Route, the Antonine Wall, Rough Castle fort, annexe and Military Way (SM90013). In close proximity approximately 80m to the east of the CB Route is another scheduled monument, the Antonine Wall, Rough Castle to Lime Road, and field system (SM8244).

Any works within the boundary of the Antonine Wall Frontiers of the Roman Empire WHS (WH1) and the Antonine Wall Frontiers of the Roman Empire World Heritage Buffer (WHB1) will require a heritage impact assessment. This will assess the impacts of the Project on the attributes of Outstanding Universal Value of the WHS meeting the requirements of UNESCO guidance.⁶⁹

Any groundworks required for the removal of towers along the CB route and the removal of towers may physically impact the heritage assets. Furthermore, works to remove one tower within the area of the Antonine Wall, Rough Castle fort, annexe and Military Way (SM90013) scheduled monument will require Scheduled Monument Consent.

Due to the removal of the CB Route, as well as existing screening and the general topography, significant permanent impacts on the significance of designated and non-designated assets through changes to setting are not anticipated.

There is potential for temporary impacts upon significance of designated assets through change to their setting during construction of the Project due to work on the towers and undergrounding of cables. This would include the Antonine Wall Frontiers of the Roman Empire WHS (WH1) and the Antonine Wall Frontiers of the Roman Empire WHS buffer (WHB1) and associated scheduled monuments.

Undergrounding of AA Route

Part of the section of AA route to be undergrounded is within the WHS buffer (WHB1).

Any works which may include changes to above ground infrastructure within the boundary of the Antonine Wall Frontiers of the Roman Empire World Heritage Buffer (WHB1) will require a heritage impact assessment. This will assess the impacts of the Project on the attributes of Outstanding Universal Value of the WHS meeting the requirements of UNESCO guidance.⁷⁰ There is no undergrounding of the AA Route proposed within the Antonine Wall Frontiers of the Roman Empire WHS itself.

Any groundworks required for the undergrounding of cables along the AA route may physically impact unknown archaeological assets.

⁶⁹ Guidance Toolkit for Impact Assessments in a World Heritage Context (2022), UNESCO <https://unesdoc.unesco.org/ark:/48223/pf0000382347>

⁷⁰ Guidance Toolkit for Impact Assessments in a World Heritage Context (2022), UNESCO <https://unesdoc.unesco.org/ark:/48223/pf0000382347>

Due to the undergrounding of parts of the AA route, as well as existing screening and the general topography, significant permanent impacts on the significance of designated and non-designated assets through changes to setting are not anticipated.

There is potential for temporary impacts upon significance of the Antonine Wall Frontiers of the Roman Empire WHS buffer (WHB1) through change to its setting during construction of the Project due to work on the undergrounding of cables.

ZG, XX and XR Routes

It is assumed that the footprint of the existing towers have been subject to previous ground disturbance associated with the construction of the ZG, XX and XR routes, therefore no further assessment will be required where there will be no alterations or construction works to existing towers. However, there remains the potential for physical impacts in areas where the construction phase will include works such as foundation upgrades, and it is assumed that the assessment will be limited to these locations. Furthermore, additional works which may result in ground disturbance such as access tracks, construction compounds, and laydown areas will be required along the overhead line components of the Project. As such, the archaeological potential of the area will be assessed as part of the full impact assessment in the EIAR.

Denny North, Bonnybridge, Cumbernauld, Easterhouse and Wishaw Substations

While it is clear that the footprint of the existing substations has been subject to previous ground disturbance, there still remains the potential for impacts to heritage assets during construction of the Project where works will comprise the extension of substation platforms and associated security fencing, along with access tracks, construction compounds, and laydown areas which will be required. As such, the archaeological potential of these areas will be assessed as part of the full impact assessment in the EIAR.

6.4 Identification of Potential Effects

New-build Overhead Line

The potential significant effects resulting from the construction of the New-build Overhead Line could include:

- Permanent physical impacts on designated and non-designated heritage assets due to construction (such as foundations for new towers);
- Permanent physical impacts on designated and non-designated assets due to construction of access tracks or other infrastructure;
- Permanent physical impacts on designated and non-designated heritage assets due to construction of temporary construction compounds or other works areas;
- Permanent impacts on the significance of designated heritage assets through changes to setting due to construction of the new towers and the presence of the towers and overhead lines within the setting of heritage assets during construction and operation.

Removal of CB Route

The potential significant effects resulting from removal of the CB route could include:

- Permanent physical impacts on designated and non-designated heritage assets due to dismantling of the existing overhead line (such as removal of tower foundations);
- Permanent physical impacts on non-designated assets due to construction of access tracks or other infrastructure;
- Permanent physical impacts on non-designated heritage assets due to construction of temporary construction compounds or other works areas;
- Permanent impacts on the significance of designated heritage assets due to changes from their setting due to the removal of the CB route. While this beneficial impact would have the potential to be offset by the New-build Overhead Line, the careful placement of towers outside the Antonine Wall would reduce or offset overall impact on the setting of designated heritage assets, in particular the Antonine Wall Frontiers of the Roman Empire WHS and the Antonine Wall Frontiers of the Roman Empire WHS buffer; and
- Temporary impacts on the significance of designated heritage assets due to changes to their setting from the introduction of elements such as machinery and lighting during construction.

Undergrounding of AA Route

The potential significant effects resulting from the undergrounding of the AA route could include:

- Permanent physical impacts on unknown archaeological assets due to construction (such as removal of tower foundations, stripping of topsoil and excavation of trenches for underground cables);
- Permanent physical impacts on unknown archaeological assets due to construction of access tracks or other infrastructure;
- Permanent physical impacts on unknown archaeological assets due to construction of temporary construction compounds or other works areas; and
- Temporary impacts on the significance of designated heritage assets due to changes to their setting from the introduction of elements such as machinery and lighting during construction.

ZG, XX & XR Upgraded Routes

Due to the nature of the construction works proposed, the potential for significant effects from the construction of the Project on heritage assets are thought to be minimal as the footprint of the towers have been previously disturbed. However, the potential impacts resulting from construction could include:

- Permanent physical impacts on non-designated heritage assets due to construction (such as foundation strengthening should it be required);
- Permanent physical impacts on non-designated assets due to construction of access tracks or other infrastructure;

- Permanent physical impacts on non-designated heritage assets due to construction of temporary construction compounds or other works areas; and
- Temporary impacts on the significance of designated heritage assets due to changes to their setting from the introduction of elements such as machinery and lighting during construction.

Substation Works

Denny North Substation

Due to the nature of the construction works proposed, the potential for significant effects from the construction of the Project on heritage assets are thought to be minimal as the footprint of the substation has been previously disturbed. However, the potential impacts resulting from construction could include:

- Permanent physical impacts on unknown archaeological remains due to construction of new security fencing, temporary construction compounds or other works areas; and
- Temporary impacts on the significance of non-designated and designated heritage assets due to changes to their setting from the introduction of elements such as machinery and lighting during construction.

Bonnybridge Substation

Due to the nature of the construction works proposed, the potential for significant effects from the construction of the Project on heritage assets are thought to be minimal as the footprint of the substation has been previously disturbed. However, the potential impacts resulting from construction could include:

- Permanent physical impacts on unknown archaeological remains due to construction of substation platform extension and associated security fencing, temporary construction compounds or other works areas; and
- Temporary impacts on the significance of designated heritage assets due to changes to their setting from the introduction of elements such as machinery and lighting during construction.

Cumbernauld Substation

Due to the nature of the construction works proposed, the potential for significant effects from the construction of the Project on heritage assets are thought to be minimal as the footprint of the substation has been previously disturbed. However, the potential impacts resulting from construction could include:

- Permanent physical impacts on unknown archaeological remains due to construction of substation platform extension and associated security fencing, temporary construction compounds or other works areas; and
- Temporary impacts on the significance of non-designated and designated heritage assets due to changes to their setting from the introduction of elements such as machinery and lighting during construction.

Easterhouse Substation

Due to the nature of the construction works proposed, the potential for significant effects from the construction of the Project on heritage assets are thought to be minimal as the footprint of the substation has been previously disturbed. However, the potential impacts resulting from construction could include:

- Permanent physical impacts on unknown archaeological remains due to construction of temporary construction compounds or other works areas.

Wishaw Substation

Due to the nature of the construction works proposed, the potential for significant effects from the construction of the Project on heritage assets are thought to be minimal as the footprint of the substation has been previously disturbed. However, the potential impacts resulting from construction could include:

- Permanent physical impacts on unknown archaeological remains due to construction of substation platform extension and associated security fencing, temporary construction compounds or other works areas; and
- Temporary impacts on the significance of non-designated and designated heritage assets due to changes to their setting from the introduction of elements such as machinery and lighting during construction.

6.5 Assessment Methods

Due to the identified potential impacts set out in section 6.5, the assessment of cultural heritage and archaeology is scoped into assessment within the EIA. The aspects of cultural heritage and archaeology that are scoped into assessment for each of the project elements are set out in section 6.7. This section outlines the methodology for assessment for those aspects scoped into assessment in the EIA.

Study Areas

The same Study Areas used for the scoping, will also be used to assess the known archaeology and built heritage in the EIA.

For the proposed uprated overhead lines, information collected from the desk-based research will be used to describe the known archaeology and built heritage within the 250m Study Area.

For the proposed substation works, information collected from desk-based research will be used to describe the known archaeology and built heritage within the 250m Study Area and the wider 500m Study Area that will be used for the setting assessment.

For the New-build Overhead Line, information collected from desk-based research will be used to describe the known archaeology and built heritage within the 500m Study Area and the wider 2km Study Area that will be used for the setting assessment.

The setting assessment will be aided by assets which fall within the ZTV prepared for the Landscape Visual Impact Assessment, as well as professional judgment. Some assets beyond this distance may also be considered where elements of their setting extend within the 500m Study Area.

Data Sources

Desk-based research will be undertaken as part of the EIA. Additional information will be gathered from the following sources:

- Falkirk Council Historic Environment Record;

- North Lanarkshire Council Historic Environment Record;
- Falkirk Archives, Callendar House;
- North Lanarkshire Archives, North Lanarkshire Heritage Centre;
- Canmore National Record of the Historic Environment website⁶⁵;
- PastMap website and database⁶⁶ for the National Monuments Record, Scheduled Monuments, listed buildings, Inventory of Gardens and Designed Landscapes, and Inventory of Historic Battlefields;
- Historic Environment Scotland⁶⁷ for buildings at risk register;
- National Library of Scotland for plans and maps of the Study Area and its environs; and
- Geotechnical data and other assessments as appropriate and available.
- Field inspection walkover.

Assessment Methodology

The impact assessment in the EIA will consider any impacts to the value (significance) of an asset, either physically or through changes to its setting.

-The value (significance) of a heritage asset is determined by professional judgement, guided but not limited to any designated status the asset may hold. The value of an asset is also judged upon a number of different factors including the special characteristics the assets might hold which can include evidential, historical, aesthetic, communal, archaeological, artistic and architectural interests. This value of a heritage asset is assessed primarily in accordance with the guidance set out in NPF4⁵⁵ and the Historic Environment Policy for Scotland (HESP)⁵⁶. The value (significance) is defined by the sum of its heritage interests. Taking these criteria into account, each identified heritage asset can be assigned a level of value (significance) in accordance with a five-point scale as set in Table 6-.

Table 6-1 Heritage Value (Sensitivity) Criteria

Value	Examples
Very High	• WHS; • Assets of acknowledged international importance; and • Historic landscapes of international sensitivity, whether designated or not.
High	• Scheduled Monuments; • Non-designated sites / features of schedulable quality and national importance; • Category A Listed Buildings; • Gardens and landscape on the Inventory of Designed Landscapes of outstanding archaeological, architectural or historic interest; and

Value	Examples
	Registered Battlefields.
Medium	- Sites / features that contribute to regional research objectives; - Category B and C Listed Buildings; - Locally listed or non-designated buildings that can be shown to have special interest in their fabric or historical association; - Conservation areas; - Historic townscapes or built-up areas with historic integrity in their buildings, or built settings; and - Non-designated historic landscapes of regional sensitivity.
Low	- Non-designated sites / features of local importance; - Non-designated buildings of modest quality in their fabric or historical association; and - Historic landscapes whose sensitivity is limited by poor preservation and / or poor survival of contextual associations or with specific and substantial importance to local interest groups.
Negligible	- Assets with very little or no surviving archaeological interest; - Buildings of no architectural or historical note; buildings of an intrusive character; and - Landscapes with little or no significant historical interest.

Having identified the value of the heritage asset, the next stage in the assessment will be to identify the level and degree of impact to an asset arising from the Project. Impacts may arise during construction or operation and can be temporary or permanent. Impacts can occur to the physical fabric of the asset or affect its setting.

When professional judgement is considered, some sites may not fit into the specified category in this table. Each heritage asset will be assessed on an individual basis and take account of regional variations and their individual qualities.

The level and degree of impact (magnitude of impact) will be assigned with reference to a five-point scale as set out in Table 6-2 Magnitude of Change Criteria. In respect of cultural heritage, an assessment of the level and magnitude of impact is made in consideration of any scheme design mitigation (embedded mitigation).

Table 6-2 Magnitude of Change Criteria

Magnitude of Change	Examples
High	Total removal or alteration of an asset, such that the physical resource and/or the key components of its setting are totally altered resulting in complete change to an asset's setting and loss of heritage value of the asset.
Medium	Partial alteration of an asset, such that the heritage value of the resource and/or the key components of its setting are clearly modified.
Low	Minor alteration of an asset, such that the components of its setting are noticeably different, but the physical characteristics are not affected and the impact does not result in a noticeable loss of heritage value.
Negligible	Slight changes to historic elements that hardly affect the setting of an asset and do not result in any loss of value.
No Change	No change.

n assessment of the level of significant effect, having taken into consideration any embedded mitigation, will be determined by cross-referencing between the significance (heritage value) of the asset (Table 6-) and the magnitude of impact (Table 6-2). The resultant level of significant effect can be negligible, minor, moderate or major and neutral, adverse or beneficial.

An assessment of the predicted significance of effect will be made both prior to and following the implementation of mitigation measures to identify the residual effects. This first highlights where mitigation may be appropriate, and then demonstrates the effectiveness of that mitigation, providing a framework for the assessment of the significance of effect which takes mitigation measures into consideration.

All archaeological work will be undertaken in line with guidance published by the ClfA⁶³ and the UNESCO Guidance Toolkit for Impact Assessments in a World Heritage Context⁶⁴. The setting assessment should follow the HES Guidance on Managing Change in the Historic Environment: Setting⁶⁰.

Consultation

Full consultation will be carried out with key heritage stakeholders to obtain feedback on the Project. This will include, but not be limited to, consulting the following bodies:

- HES;

- Falkirk Council Archaeologist/Conservation Officer; and
- North Lanarkshire County Archaeologist/Conservation Officer.

The results of desk-based research and the layout design will be discussed with the Falkirk and North Lanarkshire Archaeological Advisors to agree any requirement for additional field evaluation, such as geophysical survey or trial trenching, prior to determination.

6.6 Summary of Proposed Scope

This EIA scoping chapter has set out the proposed scope and methodology for the assessment of effects of the Project on cultural heritage. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Project.

Cultural heritage and archaeology has been scoped into the EIA assessment due to potential for physical impacts to archaeology and both permanent and temporary setting changes to designated heritage assets during construction and operation.

The New-build Overhead Line (see Table 6-3) will have the potential to result in permanent setting changes to designated heritage assets and non-designated heritage during construction and operational phases.

Due to the nature and scale of the Project, permanent setting changes to designated and non-designated heritage assets during operation have been scoped out for the removal of the CB route and the undergrounding of the AA route as the proposed works will remove existing overhead line towers from the landscape (see Table 6-4).

Permanent setting changes to designated and non-designated heritage assets during operation have also been scoped out for the uprating of the ZG, XX and XR routes (see

Table 6-5 and Table 6-7). This is due to the presence of the existing overhead line towers, which will not be altered in a way that would alter the setting of the assets or make them more visible within the landscape, for example there will be no change in height of the overhead line towers.

Permanent setting changes to designated and non-designated heritage assets during operation have also been scoped out for the proposed works at the Denny North, Bonnybridge, Cumbernauld, Easterhouse and Wishaw substations (see

Table 6-8 to

Table 6-12 Scope of Cultural Heritage Assessment for Wishaw Substation). This is due to the presence of the existing substations, which will not be altered in a way that would alter the setting of the assets or make them more visible within the landscape.

Table 6-3 Scope of Cultural Heritage Assessment for New-build Overhead Line

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	

Receptor	Scoped in / out per phase		Justification
World Heritage Site	In	In	Permanent physical impacts & setting impacts
World Heritage Site Buffer	In	In	Permanent physical impacts & setting impacts
Scheduled Monuments	In	In	Permanent physical impacts & setting impacts
Listed Buildings	In	In	Permanent setting impacts
Conservation Areas	Out	Out	No impacts
Battlefields	In	In	Permanent setting impacts
Non-designated heritage assets	In	In	Permanent physical impacts & setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-4 Scope of Cultural Heritage Assessment for Removal of CB Route

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
World Heritage Site	In	Out	Permanent physical impacts & temporary setting impacts
World Heritage Site Buffer	In	Out	Permanent physical impacts & temporary setting impacts
Scheduled Monuments	In	Out	Permanent physical impacts & temporary setting impacts
Listed Buildings	In	Out	Temporary setting impacts
Conservation Areas	In	Out	Temporary setting impacts
Battlefields	In	Out	Permanent physical impacts & temporary setting impacts

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
Non-designated heritage assets	In	Out	Permanent physical impacts
Unknown archaeological remains	In	Out	Permanent physical impacts & temporary setting impacts

Table 6-5 Scope of Cultural Heritage Assessment for Undergrounding of AA Route

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
World Heritage Site Buffer	In	Out	Temporary setting impacts
Scheduled Monuments	In	Out	Temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-6 Scope of Cultural Heritage Assessment for ZG Route

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
World Heritage Site	In	Out	Temporary setting impacts
World Heritage Site Buffer	In	Out	Temporary setting impacts
Scheduled Monuments	In	Out	Temporary setting impacts
Listed Buildings	In	Out	Temporary setting impacts
Non-designated heritage assets	In	Out	Permanent physical impacts & temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-7 Scope of Cultural Heritage Assessment for XX / XR Route

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
World Heritage Site	In	Out	Temporary setting impacts T
Listed Buildings	In	Out	Temporary setting impacts
Non-designated heritage assets	In	Out	Permanent physical impacts & temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-8 Scope of Cultural Heritage Assessment for Denny North Substation

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
Scheduled Monuments	In	Out	Temporary setting impacts
Non-designated heritage assets	In	Out	Temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts
Scheduled Monuments	In	Out	Temporary setting impacts

Table 6-9 Scope of Cultural Heritage Assessment for Bonnybridge Substation

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
World Heritage Site buffer	In	Out	Temporary setting impacts
Scheduled Monuments	In	Out	Temporary setting impacts
Non-designated heritage assets	In	Out	Temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-10 Scope of Cultural Heritage Assessment for Cumbernauld Substation

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
Non-designated heritage assets	In	Out	Temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-11 Scope of Cultural Heritage Assessment for Easterhouse Substation

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
Non-designated heritage assets	In	Out	Temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-12 Scope of Cultural Heritage Assessment for Wishaw Substation

Receptor	Scoped in / out per phase		Justification
	Construction	Operation	
Non-designated heritage assets	In	Out	Temporary setting impacts
Unknown archaeological remains	In	Out	Permanent physical impacts

Table 6-13 Table 6-13 provides a summary of the Project Components where Heritage is scoped in, in relation to Construction and Operational phases.

Table 6-13 Summary of Proposed Scope – inclusion of Cultural Heritage and Archaeology Topic within EIARs

Project Component	Phase	Cultural Heritage and Archaeology Topic Scoped in / out?	Rationale (only where Topic is scoped out)
New-build overhead line	Construction	Scoped in	
	Operation	Scoped in	
Upgraded overhead line (ZG Route)	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated due to presence of existing overhead line towers, which will not be altered in a way that would alter the setting of heritage assets.
Upgraded overhead line (XX Route)	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated due to presence of existing overhead line towers, which will not be altered in a way that would alter the setting of heritage assets.
Upgraded overhead line (XR Route)	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated due to presence of existing overhead line towers, which will not be altered in a way that

Project Component	Phase	Cultural Heritage and Archaeology Topic Scoped in / out?	Rationale (only where Topic is scoped out)
			would alter the setting of heritage assets.
CB Route Removal and AA Route Ungrounding	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated. Existing overhead line towers will be removed from the landscape.
Denny North Substation	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated. Existing substation will not be altered in a way that would alter the setting of heritage assets.
Bonnybridge Substation	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated. Existing substation will not be altered in a way that would alter the setting of heritage assets.
Cumbernauld Substation	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated. Existing substation will not be altered in a way that would alter the setting of heritage assets.

Project Component	Phase	Cultural Heritage and Archaeology Topic Scoped in / out?	Rationale (only where Topic is scoped out)
Easterhouse Substation	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated. Existing substation will not be altered in a way that would alter the setting of heritage assets.
Wishaw Substation	Construction	Scoped in	
	Operation	Scoped out	Setting changes during operation are not anticipated. Existing substation will not be altered in a way that would alter the setting of heritage assets.

07.

Biodiversity

7. Biodiversity

7.1 Introduction

Background

This chapter presents the EIA scoping for Biodiversity for the Project. This chapter has been prepared with reference to the Chartered Institute of Ecology and Environmental Management's (CIEEM) guidance document *Guidelines for Ecological Impact Assessment in the UK and Ireland*⁷¹.

With cognisance to legislation and policy (see Section 7.2), this chapter includes details of a desk-based study (including a review of previous survey results) presenting an overview of the ecological baseline of the Study Area and the potential impacts and effects of each component of the Project on biodiversity. This chapter then presents the proposed scope for further ecological field survey required to inform the Project, and the assessment method for Ecological Impact Assessment (EclA) which will be required as part of the EIA.

Throughout this chapter the term 'ecological feature' is used to refer to sites designated for nature conservation, habitats, and species (i.e. protected, invasive, or otherwise notable flora and fauna species). Ecological features are generally discussed in relation to the 'the Desk Study Area', which is further defined in relation to biodiversity in Section 7.3. Scientific names for species are given on first mention, and common names only after. Distances are cited 'as the crow flies', unless specified otherwise.

Scoping Aims

Following CIEEM guidance⁷¹ the aims of scoping for biodiversity are to:

- Provide an overview of the baseline ecology within the Study Area, with reference to each component of the Project. This includes designated sites, habitats, and species;
- Outline the potential impacts of each component of the Project and identify which ecological features could potentially be affected during the Project;
- Determine the requirement, scope, and methods for ecological field survey necessary to generate the ecological baseline for each component of the Project; and
- Outline the approach and content of the EclA that will be required for the EIA.

7.2 Relevant Legislation, Policy and Guidance

Legislation

The following nature conservation legislation is potentially relevant to the Project and will be considered during the EIA:

⁷¹ Guidelines for Ecological Impact Assessment in the UK and Ireland (September 2024), CIEEM <https://cieem.net/wp-content/uploads/2018/08/EclA-Guidelines-v1.3-Sept-2024.pdf>

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the ‘Habitats Directive’)⁷²;
- Council Directive 2009/147/EC on the conservation of wild birds (the ‘Birds Directive’)⁷³;
- The Convention on Wetlands of International Importance (‘Ramsar Convention’)⁷⁴;
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the ‘Habitats Regulations’)⁷⁵;
- The Wildlife and Countryside Act 1981 (as amended) (the ‘WCA’)⁷⁶;
- The Nature Conservation (Scotland) Act 2004 (as amended)⁷⁷;
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended) (‘WANE Act’)⁷⁸; and
- The Protection of Badgers Act 1992 (as amended)⁷⁹.

National Planning Policy

NPF4⁸ includes the following statements of policy intent which are relevant to biodiversity:

“To protect, restore and enhance natural assets making best use of nature-based solutions.”

“To protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks.”

Wherever possible and proportionate to the scale and nature of the project, the Project will therefore seek to deliver benefits for biodiversity, in addition to protecting existing biodiversity. NPF4 also states that major development will only be supported where nature networks “are in a demonstrably better state than without intervention” using best practice and including future monitoring and management where appropriate.

At the time of preparing this chapter, there is no formal policy requirement in Scotland to undertake quantitative biodiversity net gain (BNG) assessment as part of the planning process for infrastructure developments. However, on 20 September 2023, Scottish Government published an independent research report⁸⁰ which supports the development of a Scottish metric for measuring biodiversity, to allow for consistent and comparable

⁷² Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (May 1992), European Union <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01992L0043-20070101&from=EN>

⁷³ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (November 2009), European Union <https://eur-lex.europa.eu/eli/dir/2009/147/oj/eng>

⁷⁴ The List of Wetlands of International Importance (2025), Ramsar <https://www.ramsar.org/sites/default/files/2023-08/sitelist.pdf>

⁷⁵ The Conservation (Natural Habitats, &c.) Regulations 1994 (1994) UK Government <https://www.legislation.gov.uk/ukxi/1994/2716/contents>

⁷⁶ The Wildlife and Countryside Act 1981 (October 1981), UK Government <https://www.legislation.gov.uk/ukpga/1981/69/contents>

⁷⁷ Nature Conservation (Scotland) Act 2004 (June 2004), Scottish Government <https://www.legislation.gov.uk/asp/2004/6/contents>

⁷⁸ The Wildlife and Natural Environment (Scotland) Act 2011 (April 2011), Scottish Government <https://www.legislation.gov.uk/asp/2011/6/introduction/enacted>

⁷⁹ The Protection of Badgers Act 1992 (July 1992) UK Government <https://www.legislation.gov.uk/ukpga/1992/51/contents>

⁸⁰ Research into Approaches to Measuring Biodiversity in Scotland. Final Report to Scottish Government (September 2023), McVittie, A., Cole, L., McCarthy, J., Fisher, H. and Rudman, H. <https://www.gov.scot/publications/research-approaches-measuring-biodiversity-scotland/documents/>

assessment of losses or gains in biodiversity. NatureScot was instructed by the Scottish Government to commence work on developing a biodiversity metric that will be suitable for use in supporting the delivery of the biodiversity policy in NPF4.

In compliance with the biodiversity policy contained within NPF4, the Project will therefore seek to both protect existing ecological features that may be impacted by the Project and deliver positive effects for biodiversity. Furthermore, in anticipation of a future requirement to undertake BNG assessment, and to demonstrate in a quantitative manner that the Project will deliver an overall gain for biodiversity, a formal BNG assessment will be carried out for the New-build Overhead Line and Substations

Prior to the UK's exit from the European Union (EU), Scotland's European sites (i.e. Special Areas of Conservation (SAC) and SPA) were part of a wider European network of such sites known as the Natura 2000 network. Now that the UK has left the EU, Scotland's SAC and SPA are no longer part of the Natura 2000 network but form part of a UK-wide network of designated sites referred to as the UK site network. However, it is current Scottish Government policy to retain the term 'European site' to refer collectively to SACs and SPAs⁸¹.

Local Planning Policy

The Project spans two local authority areas: FC and NLC. Local planning policies for the FC area are detailed in the Falkirk LDP2⁸², adopted August 2020. Policies of Falkirk LDP2 relevant to nature conservation are summarised in Table 7-1.

Table 7-1 Summary of Relevant Policies within Falkirk LDP2

Policy	Relevant Purpose
PE13: Blue and Green Network	PE13 sets out in broad terms how the Central Scotland Green Network will be implemented in the Falkirk area. The spatial focus will be on a series of green and blue network components and corridors.
PE14: Countryside	PE14 states there will be a limit to the expansion of settlements and land outwith these boundaries is designated as countryside.
PE16: Protection of Open Space	PE16 states the Council has prepared an Open Space Strategy, which is based on a detailed audit of its parks and open spaces, and sets out a vision, standards and priority actions for improving the open space resource. If the open space is of significant ecological value, then development of the open space will not occur.
PE19: Biodiversity and Geodiversity	PE9 sets out standard legal requirements for protected sites and levels of justification for permitting developments affecting them (the stringency dependent on the nature of the designation), and requirements for mitigation.

⁸¹ EU Exit: Habitats Regulations in Scotland (2020), Scottish Government <https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/>

⁸² Falkirk Local Development Plan 2 (August 2020) Falkirk Council <https://www.falkirk.gov.uk/development-planning/falkirk-local-development-plan-2>

Policy	Relevant Purpose
PE20: Trees, Woodland and Hedgerows	PE20 sets out that Scottish Government's policy on Control of Woodland Removal will be followed, and that ancient, semi-natural and long-established woodland, including sites identified in the Scottish AWI, will be protected as a resource of irreplaceable value. Also, that enhancement and management of existing woodland and hedgerows will be encouraged and management plans implemented where necessary, and preference for locally native species in new and replacement planting.
PE22: The Water Environment	PE22 recognises the water environment within the Council area is important in terms of its landscape, ecological, recreational and land drainage functions. This policy aims to improve the water environment.

FC also published a Biodiversity Action Plan (BAP)⁸³. The BAP sets out actions plans for the following themes: estuary, farmland and grassland, heath and bog, water and wetland, woodland, urban, bean geese *Anser fabalis*, connecting people and wildlife, and invasive non-native species.

The North Lanarkshire LDP⁸⁴ was adopted in 2022. Policies of North Lanarkshire LDP2 relevant to nature conservation are summarised **Error! Reference source not found..**

Table 7-2 Summary of Relevant Policies within North Lanarkshire LDP2

Policy	Relevant Purpose
PROM LOC4: Special Landscape Areas & Green Network Improvements	PROM LOC4 sets out the requirement for all provisions within the 'Protecting Assets' and 'Environmental & Design Qualities' policies to be satisfied for proposals affecting Special Landscape Areas and Green Networks.
PROT A: Natural Environment and Green Network Assets	PROT A states that the Council will safeguard natural heritage assets including international sites (e.g. European sites), national sites (e.g. SSSIs and Ancient Woodland), Local sites (e.g. Seven Lochs Wetland Park, Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), Geodiversity Sites), Urban Green Network (e.g. wildlife corridors, trees and woodlands, watercourses and wetlands and flood plains), and Protected species.
EDQ 1: Site Appraisal	EDQ 1 details the matters to be addressed within site appraisal including " <i>Green Network, landscape character and quality on the site and surrounding Land Use Character Area</i> ", " <i>impacts associated with the holistic water environment and</i>

⁸³ Second Nature- A Biodiversity Action Plan for the Falkirk Council Area (March 2019), Falkirk Council <https://fcwebsites.blob.core.windows.net/www/media/cc12cee9-df25-46f7-9f8b-8ec2e2287edf/Second%20Nature%20-%20A%20Biodiversity%20Action%20Plan%20for%20the%20Falkirk%20Council%20Area.pdf>

⁸⁴ North Lanarkshire Local Development (2022) North Lanarkshire Council <https://www.northlanarkshire.gov.uk/planning-and-building/development-plans/current-north-lanarkshire-local-development-plan>

Policy	Relevant Purpose
	<i>flood risk”, and “biodiversity of plants and animals on the site and surrounding Land Use Character Area.”</i>
EDQ 3: Quality of Development	EDQ 3 sets out the high standards of site planning expected from developments, including consideration of existing Green Network features and those identified during site appraisal.

The North Lanarkshire LDP⁸⁴ is supported by the North Lanarkshire Biodiversity Action Plan 2023-2027⁸⁵ which outlines actions needed to safeguard vulnerable species in North Lanarkshire, and to protect and enhance key habitats at an ecosystem scale. It highlights priority habitats and species within the local authority area.

Floodplain and grazing marsh, hedgerows, rivers and burns, woodland, and lowland raised bog are priority habitats potentially relevant to the Project. Priority species which are potentially relevant to the Project include small pearl-bordered fritillary *Boloria selene*, barn owl *Tyto alba*, kestrel *Falco tinnunculus*, farmland waders, otter *Lutra lutra*, water vole *Arvicola amphibius*, great crested newt *Triturus cristatus*, taiga bean goose, pine marten *Martes martes* and bluebell *Hyacinthoides non-scripta*.

Guidance

The guidance in the published documents listed below are relevant to scoping and also to the EclA for the EIA for the Project, including during the assessment of effects on ecological features:

- CIEEM guidance *Guidelines for Ecological Impact Assessment in the UK and Ireland*⁷¹;
- NatureScot Standing Advice notes for protected species in relation to planning applications⁸⁶;
- NatureScot guidance *Pre-application and scoping advice for onshore wind farms*⁸⁷;
- NatureScot guidance *Assessment and Mitigation of Impacts of Power Lines and Guyed Meteorological Masts on Birds*⁸⁸;
- NatureScot guidance *Assessing Connectivity with Special Protection Areas (SPAs)*⁸⁹; and
- NatureScot guidance on *Assessing the Cumulative Impact of Onshore Wind Energy Developments*⁹⁰.

⁸⁵ North Lanarkshire Biodiversity Action Plan 2023-2027 (2023) North Lanarkshire Council https://www.northlanarkshire.gov.uk/sites/default/files/2023-11/biodiversity%20action%20plan%202023-2027%20V2%20pages%20%28Accessible%29_0.pdf

⁸⁶ Planning and Development: Protected Species (2024) NatureScot <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species>

⁸⁷ Pre-application guidance for onshore windfarms (2024) NatureScot <https://www.nature.scot/doc/general-pre-application-and-scoping-advice-onshore-wind-farms>

⁸⁸ Assessment and Mitigation of Impacts of Power Lines and Guyed Meteorological Masts on Birds (2026) NatureScot <https://www.nature.scot/doc/guidance-assessment-and-mitigation-impacts-power-lines-and-guyed-meteorological-masts-birds>

⁸⁹ Assessing Connectivity with Special Protection Areas (SPAs). Version 3 (June 2016) Scottish National Heritage <https://www.nature.scot/doc/assessing-connectivity-special-protection-areas>

⁹⁰ Assessing the Cumulative Impact of Onshore Wind Energy Developments (2018) Scottish National Heritage <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments>

In addition, other industry-standard good practice guidelines for surveying for ecological features identified as being potentially relevant to the Project will also be followed and specifically referenced in the EIAR.

7.3 Study Area

The following section provides an overview of baseline ecological conditions within the Study Area, with reference to a desk-based study, including a review of previous ecological reports prepared by AECOM, within which ecological survey was described.

Study Area

For ease of reference in this chapter, the Study Area for designated sites will be referred to as the Study Area (and is determined per type of designated sites in the following Desk Study Method section), and the Study Area for habitats and species will comprise the Scoping Boundary (as defined in Section 2.7 and shown in Appendix A, Figure 2.10).

Desk Study Method

The ecological baseline conditions described in this chapter have been determined by a desk-based study, which includes a review of online resources and reports prepared for previous ecological survey carried out within the Study Area. The desk study sought to identify ecological features which could, or are known to, occur within the Study Area and could be significantly affected by its construction, operation, and/or decommissioning (in relation to the CB route only).

A stratified approach was taken when defining the Study Area based on the likely zone of influence (Zoi) of the Project. In relation to designated sites, the following were searched for:

- European sites and Wetlands of International Importance (Ramsar sites) within 10 km of the Site. This was extended to 20km for SPA for which geese are a qualifying feature;
- SSSI within 2km of the Project; and
- Locally designated nature conservation sites (e.g. SINC, LNRs) within 1km of the Project.

The desk study also included a review of aerial imagery, previous ecological reports, and other sources to identify the ecological baseline within the Study Area. A range of data sources were used for the desk study, and these are presented in Table 7-2.

Table 7-2 Online Desk Study Data Sources

Data Source(s)	Data Obtained	Date Accessed
Ordnance Survey (OS) 1:25,000 maps and aerial photography ⁹¹	Aerial imagery to identify potential habitats and connectivity relevant to interpretation of planning policy and potential protected/notable species constraints.	28/01/2025

⁹¹ Ordnance Survey Map <https://www.bing.com/maps/>

Data Source(s)	Data Obtained	Date Accessed
Falkirk Council website ⁹²	LDP policies relevant to nature conservation and biodiversity. Local non-statutory nature conservation designations within 1km of the Site.	29/01/2025
Falkirk Council Open Data Hub ⁹³	Spatial data for local non-statutory nature conservation designations within 1km of the Site in Falkirk.	29/01/2025
North Lanarkshire Council website ⁹⁴	LDP policies relevant to nature conservation and biodiversity. Local non-statutory nature conservation designations within 1km of the Site.	29/01/2025
Scottish Government Spatial Data ⁹⁵	Spatial data for Local non-statutory nature conservation designations within 1km of the Site in North Lanarkshire.	29/01/2025
Marine Scotland Maps National Marine Plan interactive (NMPi) ⁹⁶	Rivers important for migratory fish.	29/01/2025
NatureScot SiteLink webpage	SACs, SPAs, and Ramsar sites up to 20km of the Site. SSSIs within 2km of the Site.	29/01/2025
SEPA Scotland's Environment Web Map ⁹⁷	AWI for Scotland. Results of Native Woodland Survey of Scotland (NWSS). Carbon and Peatland 2016 map. Available habitat information.	29/01/2025

Previous Surveys

A suite of ecological survey has been carried out within the Study Area between 2019 and 2022, comprising Phase 1 habitat and various species surveys. These are summarised in **Error! Reference source not found..**

⁹² Falkirk Council <https://www.falkirk.gov.uk/services/planning-building/planning-policy/local-development-plan/>

⁹³ Open Data Hub (2024) Falkirk Council <https://data-falkirk.opendata.arcgis.com/>

⁹⁴ North Lanarkshire Council <https://www.northlanarkshire.gov.uk/planning-and-building/development-plans/current-north-lanarkshire-local-development-plan>

⁹⁵ Sites of Importance for Nature Conservation (SINC) - North Lanarkshire (June 2024) Scottish Government <https://www.data.gov.uk/dataset/e82919b7-5284-459f-ae82-cac58e8a7c25/sites-of-importance-for-nature-conservation-sinc-north-lanarkshire>

⁹⁶ National Marine Plan interactive (n.d.) Marine Scotland <https://marinescotland.atkinsgeospatial.com/nmpi/default.aspx?layers=843>

NatureScot SiteLink <https://sitelink.nature.scot/home>

⁹⁷ Scotland's Environment Web Map (n.d.) SEPA <https://map.environment.gov.scot/sewebmap/>

Table 7-4 Ecology Surveys Previously Carried Out in the Study Area

Project Component	Survey	Date(s)
New-build Overhead Line (with wider corridor than current Scoping Boundary)	Ornithological surveys: vantage point (non-breeding) and roosting and foraging goose surveys.	Autumn/winter 2019/2020.
New-build Overhead Line	Phase 1 habitat survey.	July to September 2022.
	Bats (transects and static monitoring).	July to September 2022.
	Great crested newt Habitat Suitability Index assessment (HSI), eDNA and population assessment.	April to July 2022.
	Mammal surveys: otter, pine marten, water vole and badger <i>Meles meles</i> .	August to November 2022.
	Ornithological surveys: vantage point (non-breeding) and roosting and foraging goose surveys.	September 2021 to February 2022.
	Ornithological surveys: moorland breeding birds, general breeding birds, barn owl, black grouse <i>Lyrurus tetrix</i> lek and vantage point (breeding).	March to August 2022.
ZG route	Phase 1 habitat survey.	September/October 2021.
XX route	Phase 1 habitat survey.	November 2021.
XR route	Phase 1 habitat survey.	November 2021.

Baseline Conditions

Nature Conservation Sites – Statutory Sites

15 sites with statutory designations for nature conservation were identified during the desk study. Of these, there are seven European sites, comprising five SAC and two SPA. The remaining eight sites are SSSIs. Several of these sites are very close to, or within the scoping boundary, notably Slamannan SPA and SSSI, which is also intersected by the CB route, and Howierig Muir SSSI and Woodend Loch SSSI.

Sites with statutory designations for nature conservation are detailed in Table 7-3, and their locations relative to the Project are shown in Appendix A, Figure 7-1.

Table 7-3 Designated Sited Identified During the Desk Study

Designated Site	Reason(s) for Designation	Relationship to Project*
Slamannan Plateau SPA	Non-breeding taiga bean goose <i>Anser fabalis</i> .	• Within the scoping boundary intersected by CB route and close to the New-build Overhead Line; • 1.6km east of Cumbernauld Substation; • 1.7km southwest of AA route; • 3.8km south of ZG route and Bonnybridge Substation; • 7.4km south of Denny North Substation; • 5.4km northeast of XX route; • 10.6km northeast of Easterhouse Substation; • 11.5km north of XR route; and • 18km north of Wishaw Substation.
Clyde Valley Woods SAC	Mixed woodland on base-rich soils associated with rocky slopes.	• 0.7km southeast of XR route; • 1.8km southeast of Wishaw Substation; and • 9.8km south of XX route.
West Fannyside Moss SAC	Blanket bog.	• 1.2km east of the New-build Overhead Line; • 1.5km south of the CB route; • 2.2km southeast of Cumbernauld Substation; • 7.3km southwest of AA route; and • 8.5km southwest of Bonnybridge Substation and ZG route.
North Shotts Moss SAC	Active and degraded raised bog.	• 3.5km east of the XR route; • 8.4km east of the XX route;

Designated Site	Reason(s) for Designation	Relationship to Project*
Blawhorn Moss SAC	Active and degraded raised bog.	9km northeast of the XR route; and 9km east of the XX route.
Black Loch Moss SAC	Active raised bog.	9km north of the XR route; and 6.3km east of XX route.
Firth of Forth SPA	Non-breeding bar-tailed godwit <i>Limosa limosa</i>, common scoter <i>Melanitta nigra</i>, cormorant <i>Phalacrocorax carbo</i>, curlew <i>Numenius arquata</i>, dunlin <i>Calidris alpina alpina</i>, eider <i>Somateria mollissima</i>, golden plover <i>Pluvialis apricaria</i>, goldeneye <i>Bucephala clangula</i>, great crested grebe <i>Podiceps cristatus</i>, grey plover <i>Pluvialis squatarola</i>, knot <i>Calidris canutus</i>, lapwing <i>Vanellus vanellus</i>, long-tailed duck <i>Clangula hyemalis</i>, mallard <i>Anas platyrhynchos</i>, oystercatcher <i>Haematopus ostralegus</i>, pink-footed goose <i>Anser brachyrhynchus</i>, red-breasted merganser <i>Mergus serrator</i>, red-throated diver <i>Gavia stellata</i>, redshank <i>Tringa totanus</i>, ringed plover <i>Charadrius hiaticula</i>, scaup <i>Aythya marila</i>, shelduck <i>Tadorna tadorna</i>, Slavonian grebe <i>Podiceps auritus</i>, turnstone <i>Arenaria interpres</i>, velvet scoter <i>Melanitta fusca</i>, wigeon <i>Anas Penelope</i>, and waterfowl assemblage. Passage Sandwich tern <i>Sterna sandvicensis</i>.	7km east of New-build Overhead Line, CB, and AA; 8.4km east of ZG route and Bonnybridge Substation; 9.5km east of Denny North Substation; and 16.8km northeast of Cumbernauld Substation.
Slamannan Plateau SSSI	Non-breeding taiga bean goose.	- Within the scoping boundary intersected by CB route and close to the New-build Overhead Line; 1.6km east of Cumbernauld Substation; and 1.7km southwest of AA route.

Designated Site	Reason(s) for Designation	Relationship to Project*
Howierig Muir SSSI	Raised bog,	Within the scoping boundary close to the New-build Overhead Line and AA and CB routes.
Woodend Loch SSSI	Base-rich loch.	With the scoping boundary of Easterhouse Substation and XX route.
Garrion Gill SSSI	Upland mixed ash woodland.	0.7km southeast of XR route; and 1.8km southeast of Wishaw Substation.
North Bellstane Plantation SSSI	Wet woodland.	0.8km north of the New-build Overhead Line.
Bishop Loch SSSI	Base-rich loch and open water transition fen.	1km west of Easterhouse Substation and XX route.
Lady Bell's Moss SSSI	Raised bog.	1.1km east of XX route.
West Fannyside Moss SSSI	Blanket bog and non-breeding taiga bean goose.	1.2km east of the New-build Overhead Line; and 1.5km south of the CB route.

*N.B. Distances are approximate and taken from the closest point of each designated sites to the scoping boundary for each project component.

Nature Conservation Sites – Local Sites

There are four LNR located within 1km of the Project: Cambusnethan Woodland LNR, Greenhead Moss and Perchy Pond LNR, Kingshill LNR and Gartcosh LNR. These LNRs are designated for habitats, including woodlands, wetlands, and ponds. Greenhead Moss and Perchy Pond LNR is intersected by the XR route, whilst Cambusnethan Woodland LNR is approximately 0.3km southwest of Wishaw Substation and the XR route. Kingshill LNR is 0.2km east of the XR route. Gartcosh LNR is adjacent to the XX route, and 0.6km northeast of Easterhouse Substation. All of these LNRs are also designated as SINC.

There are numerous other locally designated sites, including Wildlife Sites (WS) (within the FC) and additional SINC (within NLC) also within 1km of the Project, a number of which are located within the Scoping Boundary, and/or intersected by the Project. Notable WS and SINC (i.e. those close to or bisected by the Project) comprise:

- ZG route: Torwood Mire WS, South Torwood WS;
- CB route and New-build Overhead Line: Forth and Clyde Canal WS, Roughcastle WS, Westerdrum WS, South Drum Moss WS, South Drum Claypit WS, Tippetcraig WS,

Graystone Knowe WS, Garbethill Moor SINC, East Fannyside Muir SINC, West Fannyside Muir SINC, Forest Woods SINC, Bruntrigg Moor (Palacerigg) SINC and Palacerigg Country Park SINC;

- Cumbernauld Substation: Glencryan Woods SINC;
- New-build Overhead Line: Luggie Water: Glenhove-Jockey's Well SINC, Cleuch, Cameron Burn: Staylee Glen SINC, Cameron Burn: Cameron Glen SINC, Whinrigg SINC, Cullochrigg SINC, Shank Burn East: Glenmill Rd-Brakenhirst Rd SINC, and Shank Burn East: Brakenhirst Plantation SINC;
- XX route and New-build Overhead Line: Gartcloss Marsh SINC and Laverock Knowe Quarry SINC;
- Easterhouse Substation and XX route: Woodend Loch SINC;
- XX route: Clattering Burn Glen (West): Darnhead Farm-Gartness Farm SINC, Shotts Burn & Chapelhall Meadow SINC, North Calder Water: Moffat Mills-Plains SINC, Cameron Glen (East) SINC, Burnhead Quarry SINC, Airdrie Hill Reservoir SINC, Roughcraig Glen & Blackwalk Plantation SINC, and Dalmacoulter Quarry SINC; and
- XR route: Brownhill Bog SINC, South Calder Water: Bonkle-Newmill SINC, Kingshill Wetlands and Plantations SINC, Morningside Railway (West) SINC, Auchter Water SINC, and Greenhead Moss and Perchy Pond SINC.

The locations of locally designated sites relative to the Project are shown in Appendix A, Figure 7-2.

Habitats and Invasive Plants

The Study Area for the Project is large and encompasses many different types of habitats. Large swathes comprise agricultural land, such as grazed pasture and arable fields, however there are also a number of ecologically important and notable habitats, including some listed on the Scottish Biodiversity List (SBL)⁹⁸ (which are thus identified as being of principal importance for biodiversity conservation in Scotland), such as Lowland Raised Bog, Lowland Dry Acid Grassland, Purple Moor-grass and Rush Pasture, Floodplain and Grazing Marsh, Lowland Mixed Deciduous Woodland, Eutrophic Standing Waters, Ponds, Rivers, and Hedgerows. In addition, some areas of wet modified bog in the Study Area equate to Annex I H7120 Degraded raised bogs still capable of natural regeneration.

There are several parcels of Ancient Woodland of Semi-natural Origin and Long-established Plantation Woodland (as listed on the AWI) within the Study Area, some of which is intersected by the Project. This includes one parcel of Long-established Plantation Woodland along the ZG route, four parcels of Long-established Plantation Woodland along the CB and AA routes, and two parcels of Long-established Plantation Woodland along the XX route. These occur in existing wayleaves. In addition, there are two parcels of Ancient Woodland of Semi-natural Origin and three parcels of Long-established Plantation Woodland along the New-build Overhead Line. Woodland and forestry are also discussed in Chapter 16: Land Use, Forestry, and Agriculture.

⁹⁸ Scottish Biodiversity List (2020) NatureScot <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list>

The New-build Overhead Line (which is largely similar in location to the CB route and includes the AA route) is relatively long and traverses land with a mix of uses including agricultural land, much of which is damp grazed field parcels with scattered blocks of broadleaved trees/mixed woodland and scrub, and semi-natural habitat, along with generally sparse buildings and hardstanding scattered throughout. There are also large areas of plantation woodland, often dominated by non-native conifer species. More ecologically notable habitats across the route include peat bog, semi-natural woodland, heathland, ponds, and marsh. The New-build Overhead Line also crosses by numerous linear features including the Forth and Clyde Canal, major roads, railways and semi-natural watercourses such as the Luggie Burn. Field boundaries are generally hedgerows which tend to be native but species-poor and dominated by hawthorn *Crataegus monogyna*.

The landscape along the ZG route is predominantly one of intensive agriculture characterised by large arable fields and grazed pasture of improved grassland, with scattered blocks of woodland and scrub. Field boundaries include narrow grassland strips, hedgerows (mostly native but species-poor) and wet and dry ditches/drains. The north of the ZG route comprises an area of raised and modified (degraded) bog adjacent to Denny North Substation. Beyond the raised bog southwards there is a large area of conifer plantation. The central part of the route comprises large arable and improved grassland fields, often bounded by hedgerows, wet and dry ditches, and narrow strips of species-poor semi-improved neutral grassland. South of the M876 there is further agricultural land and more frequent built-up areas, and the River Carron and Bonny Water. There are smaller areas of woodland, scrub and other habitats throughout.

The landscape along the XX route is similarly characterised by intensive agriculture with large, improved fields which are mainly used for grazing. The majority of the survey area comprises agricultural land with localised small and less intensively managed areas which often comprise of woodland but also include occasional areas of scrub and neutral/marshy grassland. The XX route passes around the east side of the town of Airdrie and occasionally encompasses industrial and residential areas, particularly in the far south where the route passes through the settlement of Chapelhall, over the M8 motorway and through Newhouse industrial estate. Woodend Loch is included in the far north of the route, and there are an additional five smaller waterbodies, concentrated in the far north and south. The XX route also crosses the North Calder Water and several of its tributaries, and more minor watercourses. There are also golf courses (Airdrie Golf Club and Torrance Park Golf Club) and three disused quarries within the Study Area.

Again, the landscape along the XR route is predominantly one of intensive agriculture, characterised by improved grazed pasture fields and occasional built-up areas, with scattered blocks of woodland and scrub. The far north and south of the XR route mainly comprise heavily disturbed and urban areas, previously developed land (including a presumed disused landfill site) and a golf course. Between these there are mainly large agricultural fields, often bounded by hedgerows, with small areas of woodland and other more semi-natural environments including marshy grassland, localised bog and numerous small watercourses. Other more ecologically notable habitats include neutral, acid, and marshy grasslands, woodland and scrub, and wetlands such as ponds and swamp. There are also areas of peat bog and heathland present along the route. Field boundaries include hedgerows and ditches/drains. Several small watercourses are present.

Habitats associated with the substations are more limited, and largely comprise existing hardstanding and infrastructure, with habitats such as rough grasslands, agricultural fields, hedgerows, woodland, scrub, and scattered trees.

Invasive and non-native species such as Japanese knotweed *Reynoutria japonica*, Himalayan balsam *Impatiens glandulifera*, snowberry *Symphoricarpos albus*, montbretia *Crocasmia x crocosmiiflora*, and rhododendron *Rhododendron ponticum* are frequently present in the Study Area, associated with all overhead line routes and substations.

Protected and Important Species

The Study Area comprises extensive habitat suitable for a number of protected and important species. Evidence of protected species was identified during the surveys listed in **Error! Reference source not found.**, both during targeted protected species surveys and incidentally during Phase 1 habitat surveys.

Numerous ponds were identified within the Study Area, with HSI for great crested newt carried out on 44 ponds identified along the New-build Overhead Line. Further surveys conducted along the New-build Overhead Line route identified presence of the species in ten ponds through eDNA analysis and confirmed small populations of great crested newt within five ponds through population surveys, four of which were confirmed as breeding ponds.

The Study Area contains ample suitable habitat for commuting and foraging bats, with potential for all bat species to occur. With the vast number of trees present, there is likely to be numerous trees and buildings with suitability for roosting bats.

The Study Area contains ample habitat for protected and notable mammal species. Evidence of otter (including holts), pine marten (including potential dens) and badger (including numerous setts) was identified across the Study Area. Brown hare *Lepus europaeus* were also observed on several occasions. The presence of water vole and red squirrel *Sciurus vulgaris* was not confirmed through survey, however there is suitable habitat for these species in the Study Area.

The variety of habitats within the Study Area also provide habitat for a variety of birds, such as breeding songbirds and foraging wetland species, particularly given the proximity of the New-build Overhead Line route to Slamannan Plateau SPA, designated for taiga bean goose. Numerous bird species, including bean goose, pink-footed goose, swans, and a variety of breeding songbird species, were identified across the Study Area.

Although no specific surveys were conducted along the ZG, XX, and XR routes, incidental evidence collected confirmed the presence of badger along the XR and ZG routes, and trees with suitability for bat roosts along the XX route. However, suitable habitat for badger, otter, water vole, pine marten, red squirrel, and great crested newt was identified throughout the entire Study Area. In addition, the larger watercourses, such as Bonny Water and River Carron, may be suitable for important fish species such as Atlantic salmon *Salmo salar* and European eel *Anguilla anguilla*.

7.4 Identification of Potential Effects

The process of predicting ecological impacts and effects considers relevant aspects of ecosystem structure and function. The Project could have a range of impacts upon important ecological features during construction and operation and also decommissioning in relation

to the CB route. Impacts and effects are described in the absence of specific ecological mitigation measures which may be prescribed for the Project, but inherent or embedded mitigation measures, including those for which there is a legal or general statutory requirement, can be considered.

These could comprise direct effects, which occur where the changes to an ecological feature are directly attributable to an action, such as habitat loss, or indirect effects, such as those which usually arise as a 'knock-on' effect, such as displacement of mammals as a result of habitat loss.

Potential impacts and significant effects from the construction and operation of the Project, and in relation to route CB decommissioning on ecological features will be identified and assessed within the EIA, but may include the following:

- Permanent habitat loss (e.g. due to infrastructure such as permanent access tracks or other infrastructure);
- Temporary habitat loss (e.g. due to temporary construction compounds, laydown areas);
- Habitat degradation as a result of pollution incidents (e.g. fuel or oil spills) or construction works (e.g., machine tracking);
- Permanent or temporary changes to hydrological conditions which may affect vegetation and habitats (e.g. indirect impacts on wetland habitats);
- Indirect impacts to protected and/or notable faunal species (e.g. due to loss of habitats);
- Creation of barriers to animal movements (e.g. artificial lighting could inhibit mammal activity);
- Temporary disturbance and/or displacement of species during construction (e.g. due to noise, visual disturbance, or artificial lighting);
- Disturbance and/or displacement of species during operation (e.g. due to permanent artificial lighting);
- Potential for injury or mortality of species during construction (e.g. as a result of increased vehicular traffic, entrapment in temporary excavations, or as a result of pollution incident); and
- Potential for injury or mortality of birds during operation (e.g. as a result of collision with overhead lines).

In addition, the Project could affect several European sites which have been identified as part of the desk study presented in Section 7.3, both to the sites themselves and species which may use functionally-linked habitat. Therefore, potential impacts and likely significant effects will require assessment as part of a Habitats Regulations Appraisal (HRA).

7.5 Assessment Methods

Important Ecological Features

CIEEM guidance⁷¹ recommends that only those ecological features that are 'important' and that could be significantly impacted by a development require detailed assessment, stating that "*it is not necessary to carry out detailed assessment of ecological features that are*

sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable”.

Consequently, for the purposes of future desk study, field survey and assessment of effects, ‘important’ ecological features will be taken to include:

- Sites designated for nature conservation, including those designated at international, national, and local levels, and the features for which they are designated;
- Woodland listed on the AWI;
- Habitats listed on Annex I of the Habitats Directive⁷²;
- Habitats listed on the SBL⁹⁸, which are thus identified as being of principal importance for biodiversity conservation in Scotland;
- Species listed on Annexes I and II of the Habitats Directive⁷²;
- Species listed on Annex I of the Birds Directive⁷³;
- Species listed on Schedules 2 and 4 of the Habitats Regulations⁸¹;
- Species listed on Schedule 1, 5 and 8 of the WCA⁷⁶, and badger;
- Species listed on the SBL⁹⁸, which are thus identified as being of principal importance for biodiversity conservation in Scotland;
- Bird species listed on the Red List of Birds of Conservation Concern (BoCC) 5⁹⁹; and
- Invasive non-native species listed on Schedule 9 of the WCA⁷⁶ (although this does not legally apply in Scotland), those considered to be of EU concern under the Invasive Alien Species Regulation (Regulation (EU) 1143/2014)¹⁰⁰, and additional species commonly considered to be invasive as listed in Annex B of the NatureScot Developing with Nature guidance¹⁰¹.

In addition, important ecological features may extend include other habitats or species that may be rare, scarce or otherwise notable will be included where deemed appropriate through available information and/or professional judgement.

Ecological Impact Assessment

The identification and assessment of impacts and significant effects to inform the EIA will follow CIEEM guidance⁷¹. These guidelines set out a process of identifying the baseline ecology and value of ecological features, identifying and characterising the impacts and likely significant effects, describing the mitigation measures required, and assessing the significance of the residual effects once mitigation is considered.

99 The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands, and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain (2021) Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. British Birds, 114, pp 723-747.

100 Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species

101 Developing with Nature guidance (2023) NatureScot <https://www.nature.scot/doc/developing-nature-guidance>

The results of the existing baseline and updated ecological field surveys (see Section 7.6), in combination with the outcomes of the desk study, and any consultation with relevant stakeholders, will be used to inform the EclA component of the EIA.

Where significant effects on an ecological feature are predicted by the EclA, appropriate mitigation measures will be proposed. Enhancement measures that are proportionate to the scale and impacts of the Project will also be identified in pursuance of the objectives of NPF4**Error! Bookmark not defined.** to ensure that development delivers gains for biodiversity.

Biodiversity Net Gain Assessment

In accordance with the Applicant's commitment to achieving BNG and in line with the biodiversity policy of NPF4**Error! Bookmark not defined.**⁵ (as previously mentioned in Section 7.2), a BNG assessment each will be prepared for the New-build Overhead Line and the Substations Works at Denny North Substation, Bonnybridge Substation, Cumbernauld Substation, and Wishaw Substation. BNG assessments are not proposed for the existing overhead lines to be uprated (ZG, XX and XR routes) or those to be removed (CB route), as well as at Easterhouse Substation as habitat changes are likely to be minimal. The BNG assessment will quantify the overall effect of the Project on the biodiversity value within the Study Area and is achieved by comparing the baseline habitat value pre- and post-construction. The assessment considers the level of proposed habitat loss, retention, enhancement, and any creation delivered by the Project. The assessment will use SSE Networks' BNG Toolkit.

Habitats Regulations Appraisal

In addition to the EIA, the identification and assessment of impacts and significant effects in relation to European sites will also inform an HRA. The HRA will identify potential impacts, their pathways, and any likely significant effects arising from the Project to European sites or their qualifying features, both alone and in-combination with other plans and projects. The assessment will include both the European sites themselves and species which may use functionally-linked habitat. Where significant effects are identified, the Project will subsequently be assessed to determine if such effect, when considered with any relevant mitigation, will impact the integrity of any European sites in light of the sites' conservation objectives.

7.6 Summary of Proposed Scope

Based on the information collected through the desk study, previous ecological survey, and the recommendations in relevant guidance documents, it is proposed that the field surveys described in the following subsections are carried out to determine (and where relevant, update) the baseline ecology of the Project. All surveys are to be carried out at the appropriate time of year as determined by the relevant survey guidance document(s) per survey type.

Not all surveys are required for all components of the Project, and the specific survey types proposed for each component are clarified in the following subsections. However, it is worth noting that the following scope has been proposed in the absence of detailed design of each component of the Project. For example, the New-build Overhead Line is likely to result in relatively more impacts and potential for effects than the uprating of overhead lines.

Therefore, the scope proposed is very dependent on the scale of the works that are required, particularly in relation to the works required for the Up-rated Overhead Lines, and on this basis, it is considered that the scope should be amended or reduced appropriately, once the design of the Project and the requirements for construction works are finalised.

NatureScot have confirmed that they consider sufficient data have been collected for birds and therefore, no further ornithological surveys are proposed.

Habitats

New-build Overhead Line and Substation Works

Updated habitat survey adopting the Phase 1 habitat survey¹⁰² will be completed within 100m of proposed infrastructure for New-build Overhead Line and substation components of the Project (and for the AA route undergrounding where it crosses the route). The Phase 1 habitat survey will establish and map any changes in baseline conditions (as identified by the surveys carried out in 2021/22), and possible groundwater dependent terrestrial ecosystems (GWDTE). The survey will extend up to 250m in cases where there may be GWDTE and where excavations will exceed 1m in depth. In addition, Habitat Condition Assessments will be carried out where habitat loss is anticipated in relation to the New-build Overhead Line and substations to inform BNG assessments.

In addition, Priority Habitats listed on the SBL⁹⁸ that were identified during previous surveys will also be subject to targeted National Vegetation Classification (NVC) surveys¹⁰³ (which will be carried out following published guidelines for the relevant habitat type).

Areas of possible GWDTE identified by the Phase 1 habitat survey will also be subject to NVC surveys. For each identified possible GWDTE, an assessment of groundwater dependence will be made within the Water Environment EIAR Chapter.

Up-rated Overhead Lines

Updated habitat survey adopting the Phase 1 habitat survey¹⁰² will be completed within 100m of the Project (including all temporary access tracks, construction compounds etc.) for the Up-rated Overhead Lines, to establish and map any changes in baseline conditions (as identified by the surveys carried out in 2021/22). It is not proposed to prepare BNG assessments for the Up-rated Overhead Lines, and therefore Habitat Condition Assessments are not required.

In addition, NVC surveys¹⁰³, which will be carried out following published guidelines for the relevant habitat type, are proposed for habitats along the following routes:

- ZG route: habitats within Torwood Mire WS, Torwood South WS and the wayleave south of Denny North Substation;
- XR route: modified bog habitat, woodland Priority Habitats listed on the SBL, and other notable habitats located within SINCs; and

¹⁰² Handbook for Phase 1 habitat survey- A technique for environmental audit (2010) JNCC

<https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf>

¹⁰³ National Vegetation Classification: Users' handbook (2006) JNCC <https://data.jncc.gov.uk/data/a407ebfc-2859-49cf-9710-1bde9c8e28c7/JNCC-NVC-UsersHandbook-2006.pdf>

- XX route: modified bog habitat, woodland Priority Habitats listed on the SBL, dry acid grassland, and other notable habitats located within SINCs.

Invasive Non-native Plants

Surveys for invasive non-native plant species are proposed for all components of the Project. All invasive and non-native plant species present will be recorded, with specific reference to species that are commonly considered to be invasive within the NatureScot guidance¹⁰¹. Surveys will be carried out within 30m of the New-build Overhead Line and the Upgraded Overhead Lines (including proposed works locations), and within the boundary of each substation site and extending to 30m beyond each substation site boundary.

Great Crested Newt

New-build Overhead Line

The proposed scope of survey for great crested newt for the New-build Overhead Line will comprise:

- Updated eDNA surveys for ponds where presence of great crested newts was previously confirmed through both eDNA and population surveys (required to confirm continued presence in ponds);
- Updated eDNA surveys for ponds which have previously been assessed as having an HSI score greater than “Poor”; and
- Population surveys (e.g. bottle trapping, torching, egg-searching) of ponds where eDNA previously confirmed presence of great crested newts (required to confirm presence/absence and population estimates).

Upgraded Overhead Lines

Ponds and waterbodies within 250m of infrastructure and/or construction works (including all temporary access areas, site compounds, etc.) for the Upgraded Overhead Lines will be identified and assessed for their suitability to support great crested newts using the HSI calculation. Where ponds or waterbodies are deemed to have suitability to support great crested newts (i.e. are assessed as having an HSI score greater than “Poor”), eDNA survey and analysis will be carried out to identify presence/likely absence. Further population surveys (e.g. bottle trapping, torching) may be required where a positive eDNA result is returned following a review of habitat impacts to be determined by detailed works plans.

Substation Works

It is assumed that any ponds within 250m of the substations will be captured as part of the New-build Overhead Line and Upgraded Overhead Lines surveys.

Otter and Water Vole

New-build Overhead Line

Targeted otter surveys were undertaken in 2022. It is not proposed to repeat these surveys in full, as evidence of presence (including holts) was identified during previous surveys, and it is assumed that pre-construction surveys will be required as mitigation.

Camera trapping surveys will be carried out on otter holts previously identified during field surveys along the New-build Overhead Line route. Camera trapping surveys will follow

guidance in published literature¹⁰⁴¹⁰⁵. The camera trap data will inform the assessment, as will be used to determine the usage of the holts, and thus the potential level of effect on any otters using the features.

A single targeted water vole survey was undertaken in 2022. A second water vole survey is proposed and will be carried out along all suitable water features (including watercourses and waterbodies), within 50m of proposed infrastructure (including all temporary access tracks, construction compounds, etc.), and will follow guidance in published literature¹⁰⁶. Evidence of water vole to be searched for will include latrines, droppings, burrows, trails, and foraging evidence.

Upgraded Overhead Lines and Substation Works

Survey for otter and water vole will be carried out along all suitable water features (including watercourses and waterbodies), within 200m of proposed infrastructure and/or construction works (including all temporary tracks, construction compounds etc.) for otter and within 50m for water vole. The survey will follow guidance in published literature¹⁰⁴¹⁰⁶. Otter survey will be carried out on one occasion, with up to two visits carried out for water voles (in areas of elevated habitat potential). Evidence of otter to be searched for will include refuges (holts and lie-ups), spraints, footprints, trails, and foraging signs. Spraints will be recorded as fresh, recent, or old, according to their apparent age. Evidence of water vole to be searched for will include latrines, droppings, burrows, trails, and foraging evidence.

Badger and Pine Marten

New-build Overhead Line

Targeted badger and pine marten surveys were undertaken in 2022. It is not proposed to repeat these surveys in full, as evidence of presence (including setts and potential dens) was identified during previous surveys, and it is assumed that pre-construction surveys will be required as mitigation. During the Phase 1 habitat survey, surveyors will also record any new badger or pine marten evidence where present.

Camera trapping surveys will be carried out on features with the potential to be used as pine marten dens previously identified during field surveys along the New-build Overhead Line route. Camera trapping surveys will follow guidance in published literature¹⁰⁷.

In the event that any active setts are identified within the footprint of the New-build Overhead Line, camera trapping may be required to confirm the presence of the species where definitive badger evidence is lacking.

¹⁰⁴ Monitoring the Otter *Lutra lutra* (2003) Chanin, P. Conserving Nature 2000 Rivers Monitoring Series No. 10. English Nature, Peterborough

¹⁰⁵ N.B. camera trapping of otter holts must be carried out under a wildlife licence

¹⁰⁶ The Water Vole Mitigation Handbook. (2016) Dean, M., Strachan, R., Gow, D. and Andrews, R. Mammal Society Mitigation Guidance Series. The Mammal Society, London.

¹⁰⁷ The Pine Marten (2002) Birks, J. The Mammal Society, London

Upgraded Overhead Lines and Substations

A badger survey will be completed within a minimum of 50m of proposed infrastructure and /or construction works, in accordance with standard guidance¹⁰⁸¹⁰⁹. Evidence to be searched for will include setts, spoil heaps, bedding, guard hairs, latrines, footprints, trails, scratch marks, and signs of foraging activity. Where possible, setts will be categorised based on evidence of use.

Concurrently with the badger survey, a search for pine marten will also to be carried out in areas of suitable habitat for this species within the same area. This will involve searching for field signs of this species, as described in Birks (2002)¹⁰⁷, including possible den sites and scats.

Roosting Bats

New-build Overhead Line and Substation Works

A walkover will be carried out to assess the bat roost suitability of all trees and structures (excluding occupied private residences) which could be directly impacted by the New-build Overhead Line and substations (i.e. they will be damaged or destroyed, or subject to artificial lighting). This will comprise daytime bat walkover (DBW), preliminary roost assessments (PRA; for buildings) and ground level tree assessments (GLTA). Any features in buildings or potential roost features (PRF) in trees which are identified will be assigned a suitability category, as defined by the Bat Conservation Trust (BCT) guidelines¹¹⁰.

Where trees or structures, which could be directly impacted by the New-build Overhead Line and/or Substations are found, and are identified as suitable for bats, there may be a requirement for further survey to determine presence/likely absence of roosting bats. Subsequent surveys will also follow the BCT guidelines and may involve aerial inspections of trees and dusk emergence surveys using night vision aids (e.g. infrared cameras).

Summary of Scope

A summary of the ecological features scoped in/surveys proposed per project component is presented in Table 7-4.

Table 7-4 Summary of Ecological Features and Surveys Scoped In

Project Component	Statutory Sites Scoped In	Local Designated Sites Scoped In	Ecological Surveys Scoped In
New-build Overhead Line	- Slamannan Plateau SPA - Firth of Forth SPA - West Fannyside Moss SAC	- Forth and Clyde Canal WS - Roughcastle WS - Westerdrum WS	- Phase 1 habitat survey - NVC (for SBL habitats and possible GWDTE)

¹⁰⁸ Surveying Badgers- An occasional publication of the Mammal Society (1989) Harris, S., Cresswell, P. and Jeffries, D. No. 9. The Mammal Society, London.

¹⁰⁹ Surveying for Badgers: Good Practice Guidelines. Version 1 (September 2018) Scottish Badgers https://www.scottishbadgers.org.uk/wp-content/uploads/2020/12/Surveying-for-Badgers-Good-Practice-Guidelines_V1-2020-2455979.pdf

¹¹⁰ Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition) (2023), Collins, J. (ed.) Bat Conservation Trust, London.

Project Component	Statutory Sites Scoped In	Local Designated Sites Scoped In	Ecological Surveys Scoped In
	- Slamannan Plateau SSSI - West Fannyside Moss SSSI - Howierig Muir SSSI	- South Drum Claypit WS - South Drum Moss WS - Tippetcraig WS - Graystone Knowe WS - North Walton Brun WS - Garbethill Moor SINC - East Fannyside Muir SINC - West Fannyside Muir SINC - Forest Woods SINC - Bruntrigg Moor (Palacerigg) SINC - Palacerigg Country Park (West) SINC - Glencryan Woods SINC; - Luggie Water: Glenhove-Jockey's Well SINC - Cleuch SINC - Cameron Burn: Staylee Glen SINC - Cameron Burn: Cameron Glen SINC - Whinrigg SINC - Cullochridd SINC - Shank Burn East: Brakenhirst Plantation SINC	- Invasive species - Great Crested Newt (GCN) (eDNA, population surveys) - Otter (camera trapping only) - Water vole survey - Badger and pine marten (camera trapping only) - Bats (DBW, PRA, GLTA)

Project Component	Statutory Sites Scoped In	Local Designated Sites Scoped In	Ecological Surveys Scoped In
		- Shank Burn East: Glenmill Rd-Brakenhirst Rd SINC - Laverock Knowe Quarry SINC	
ZG route	- Slamannan Plateau SPA - Firth of Forth SPA	- Torwood Mire WS - Torwood South WS	- Phase 1 habitat survey - NVC (for Torwood Mire WS, Torwood South WS and the wayleave south of Denny North Substation) - Invasive species - GCN (HSI, eDNA) - Otter and water vole survey - Badger and pine marten survey
XX Route	- Slamannan Plateau SPA - Woodend Loch SSSI - Bishop Loch SSSI	- Gartcosh LNR - Airdriehill Reservoir SINC - Burnhead Quarry SINC - Cameron Glen (East) SINC - Clattering Burn Glen (West): Darnhead Farm-Gartn SINC - Dalmacoulter Quarry SINC - Gartcloss Marsh SINC	- Phase 1 habitat survey - NVC (for modified bog habitat, woodland and acid grassland SBL habitat, and other notable habitats located within SINC's) - Invasive species - GCN (HSI, eDNA) - Otter and water vole survey - Badger and pine marten survey

Project Component	Statutory Sites Scoped In	Local Designated Sites Scoped In	Ecological Surveys Scoped In
		- Laverock Knowe Quarry SINC - North Calder Water: Moffat Mills-Plains SINC - Roughcraig Glen & Blackwalk Plantation SINC - Shotts Burn & Chapelhall Meadow SINC - Woodend Loch SINC	
XR Route	Slamannan Plateau SPA	- Greenhead Moss and Perchy Pond LNR - Legbrannock Burn East: Manse View SINC - Brownhill Bog SINC - South Calder Water: Bonkle-Newmill SINC - Kingshill Wetlands & Plantations SINC - Morningside Railway (West) SINC - Auchter Water SINC	- Phase 1 habitat survey - NVC (for modified bog habitat, woodland Priority Habitats listed on the SBL, and other notable habitats located within SINC's) - Invasive species - GCN (HSI, eDNA) - Otter and water vole survey - Badger and pine marten survey
Denny North Substation	- Slamannan Plateau SPA - Firth of Forth SPA	Torwood Mire WS	- Phase 1 habitat survey - NVC (for SBL habitats and possible GWDTE)
Bonnybridge Substation	Slamannan Plateau SPA	None	

Project Component	Statutory Sites Scoped In	Local Designated Sites Scoped In	Ecological Surveys Scoped In
	Firth of Forth SPA		Invasive species
Cumbernauld Substation	- Slamannan Plateau SPA - Firth of Forth SPA - Slamannan Plateau SSSI	Glencryan Woods SINC	- Otter and water vole survey - Badger and pine marten survey - Bats (DBW, PRA, GLTA)
Easterhouse Substation	- Slamannan Plateau SPA - Woodend Loch SSSI - Bishop Loch SSSI	Woodend Loch SINC	
Wishaw Substation	Slamannan Plateau SPA	None	

Ecological Features Scoped Out

Based on a lack of impact, transfer pathways between the Proposed Development and most SACs identified within the Desk Study Area, the following SACs have been scoped out from further assessment: Clyde Valley Woods SAC, North Shotts Moss SAC, Blawhorn Moss SAC, and Black Loch Moss SAC. These are all over 2 km from the Project, and separated from the Project by roads and other infrastructure, with no hydrological connectivity to the Project.

Similarly, based on a lack of pathways for impacts identified, the following SSSIs have been scoped out for further assessment: Garrion Gill SSSI, North Bellstane Plantation SSSI, and Lady Bell's Moss SSSI. These all fall within 2 km of the Project, but again are separated from the Project by roads and other infrastructure, with no hydrological connectivity to the Project.

Furthermore, a number of locally designated sites within the Desk Study Area are also scoped out from further assessment based on distance from the Project, and a lack of connectivity for impacts to occur. N.B. European sites, SSSI, and locally designated sites scoped in for further assessment depend on the specific component (and were scoped in based on proximity to the Scoping Boundary, or hydrological/ecological connectivity) of the Project, and are presented in Table 7-4.

It is not currently proposed to carry out bat activity surveys (i.e. surveys for foraging or commuting bats; however, bat activity surveys have already been carried out for the New-build Overhead Line). The Project will generally seek to avoid linear features (e.g. hedgerows) which could be used by bats for these purposes and will over-sail suitable bat habitat as far as possible. Any minor impacts on habitat which could be of value to foraging or commuting bats will be mitigated through standard and straightforward measures (e.g. replanting of any hedgerow which is removed to facilitate construction).

It is proposed to scope out of survey and assessment, fish and aquatic invertebrates. The watercourses in the vicinity of the Project are likely to be typical of this part of central Scotland, and the Project will not require significant in-channel works. Temporary watercourse crossings maybe required for access, any potential impacts on fish or aquatic invertebrates as a result of these can be reliably mitigated through standard good practice construction measures.

No targeted survey is proposed for reptiles, common amphibians, non-protected mammals (e.g. brown hare), or invertebrates. These species will all be assumed to be present where habitat is suitable, and assemblages present are likely to be typical of central Scotland with small populations. Appropriate and proportionate mitigation will be adopted where necessary to minimise impacts.

It is understood that NatureScot have confirmed that no further ornithological surveys will be required. The EIA will therefore be completed using the bird data gathered to date.

Table 7-5 provides a summary of the Project Components where Biodiversity is scoped in, in relation to Construction and Operational phases.

Table 7-5 Summary of Proposed Scope - inclusion of Biodiversity Topic within EIARs

Project Component	Phase	Biodiversity Topic Scoped in / out?	Rationale (only where Topic is scoped out)
New-build overhead line	Construction	Scoped in	
	Operation	Scoped in	
Upgraded overhead line (ZG Route)	Construction	Scoped in	
	Operation	Scoped in	
Upgraded overhead line (XX Route)	Construction	Scoped in	
	Operation	Scoped in	
Upgraded overhead line (XR Route)	Construction	Scoped in	
	Operation	Scoped in	
CB Route Removal and AA Route Ungrounding	Construction	Scoped in	
	Operation	Scoped in	
Denny North Substation	Construction	Scoped in	
	Operation	Scoped in	
Bonnybridge Substation	Construction	Scoped in	

Project Component	Phase	Biodiversity Topic Scoped in / out?	Rationale (only where Topic is scoped out)
	Operation	Scoped in	
Cumbernauld Substation	Construction	Scoped in	
	Operation	Scoped in	
Easterhouse Substation	Construction	Scoped in	
	Operation	Scoped in	
Wishaw Substation	Construction	Scoped in	
	Operation	Scoped in	

08.

Water Environment

8. Water Environment

8.1 Introduction

This scoping assessment is based on a desk study and considers the potential for impacts of the Project on surface and groundwater features (this includes impacts on their water quality, water quantity, hydromorphology, and role supporting ecological habitats).

This chapter describes the water environment baseline and receptors before setting out the potential for significant environmental effects and the scope for mitigation. It goes on to describe the surveys and assessment that will be undertaken as part of the EIAR.

This chapter is supported by the following figures:

- Figure 8.1 Surface Water Receptors;
- Figure 8.2 Groundwater Receptors; and
- Figure 8.3 Flood Risk.

Relevant Legislation, Policy and Guidance

The following national legislation is relevant to the Project:

- The Climate Change (Scotland) Act 2009;
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017;
- Pollution Prevention and Control (Scotland) Regulations 2012 (PPC);
- Environmental Liability (Scotland) Regulations 2009;
- The Private Water Supplies (Scotland) Regulations 2006;
- Water Environment Water Services ('the WEWS Act') (Scotland) Act 2003;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) ('the CAR Regulations');
- Environmental Protection Act 1990;
- Environment Act 1995; and
- The Control of Substances Hazardous to Health Regulations 2002.

National Planning Framework 4 (NPF4)

- The National Planning Framework 4 (NPF4)¹¹¹, published in February 2023 replaces the previous National Planning Framework 3 (NPF3). NPF4 sets out the Scottish Government spatial development principles, regional priorities, national developments and national planning policy, covering six spatial principles which aim to deliver sustainable places, liveable places and productive places.

¹¹¹ National Planning Framework 4 (2023), Scottish Government <https://www.gov.scot/publications/national-planning-framework-4/documents/>

- Policy 11 within NPF4 states that project design and mitigation should address any effects on hydrology, the water environment and flood risk.

Local Authority

Falkirk Council (FC) and North Lanarkshire Council (NLC) both have local development plans (LDP) which specify requirements for protecting the water environment.

Policy 22 within the Falkirk Council LDP¹¹² specifies measures to protect and improve the water environment.

Policy 1 and 3 of the North Lanarkshire Council LDP¹¹³ outlines that impacts of new developments to the water environment should be assessed within an appraisal and that developments should have sustainable drainage to minimise impacts to the water environment.

River Basin Management Plan

The River Basin Management Plan (RBMP) sets out a range of actions to address impacts to the water environment. The RBMP outlines actions for public bodies and land managers and is produced by SEPA (Scottish Environment Protection Agency) on behalf of the Scottish Government. In summary, the RBMP provides the following:

- The condition of the water environment;
- Pressures which could, or are currently impacting the water environment; and
- Actions to address any impacts.

In Scotland, the entire country is considered within one RBMP. Therefore, the Project lies within the RBMP. The latest RBMP¹¹⁴ was published in December 2021 and covers the period from 2021 until 2027.

8.2 Baseline and Study Area

To inform the scoping exercise, data, information and records relating to the water features and water resources was gathered from a number of publicly available online sources including:

- Online Ordnance Survey digital maps;
- SEPA website;
- NatureScot Standing Waters Database¹¹⁵;
- Scotland's Environment website¹¹⁶;

¹¹² Falkirk Local Development Plan 2 (2020), Falkirk Council <https://www.falkirk.gov.uk/development-planning/falkirk-local-development-plan-2>

¹¹³ North Lanarkshire Local Development Plan (2022), North Lanarkshire Council <https://www.northlanarkshire.gov.uk/planning-and-building/development-plans/current-north-lanarkshire-local-development-plan>

¹¹⁴ The River Basin Management Plan for Scotland 2021-2027 (2021), Scottish Environment Protection Agency <https://www.sepa.org.uk/media/594088/211222-final-rbmp3-scotland.pdf>

¹¹⁵ Standing Waters Database (2025), NatureScot <https://opendata.nature.scot/datasets/snh::standing-waters-database/explore?location=57.601820%2C-4.472775%2C6.00>

¹¹⁶ Scotland's Environment Map (2025), Scotland's Environment <https://www.environment.gov.scot/maps/scotlands-environment-map/>

- National River Flow Archives (UK Centre for Ecology & Hydrology);
- British Geological Survey (BGS) website; and
- BGS Hydrogeology 625k digital mapping¹¹⁷.

Additional information on water quality and resources (i.e. Water Framework Directive (WFD) investigations, consented discharges and licensed abstractions, Private Water Supplies (PWS), and historic pollution incidents) will be added to the baseline during the impact assessment stage in the EIAR following receipt of third-party data. Information on ecological potential of the water features will also be added at later stages of the assessment as survey results become available.

Baseline Overview

The Scoping Boundary is situated between Denny in the north and Wishaw in the south. The study area for this scoping exercise was determined by the location of new development and proposed construction works as well as access requirements (as described in Section 2 Project Description and presented in Figure 2.10).

Key water environment constraints have been mapped around areas of the Project as shown in Figure 8.1, Figure 8.2 and Figure 8.3. Due to the linear design of the overhead line elements, potential impacts will be focused on any watercourse crossing, or where excavations are required for trenchless crossings of other features (e.g. roads). Water features within the Scoping Boundary have been identified as part of this Scoping exercise.

For the EIAR, the baseline will also consider downstream attributes of identified water features, since water quality impacts can sometimes propagate along watercourses and so it is important to consider a downstream study area when determining the importance of the receptor. The zone of influence depends on the magnitude of impact and how quickly it may be conveyed or diluted and dispersed downstream. Based on professional judgment, a downstream study area of a few kilometres (up to around 2km) will be applied in the EIAR.

Surface Water Features

A number of surface water features are present within the Scoping Boundary. A full list of these are shown in Table 8-1 **Error! Reference source not found.** As plans for the works are yet to be finalised, all of these water features are scoped in for assessment as they may be at risk of impact through temporary crossings or foundation construction.

Table 8-1 Surface Water Features within the Study Area (See Figure 8.1)

Sub catchment	Water Feature	Relevance to the Development
River Carron	River Carron	Crossed by ZG Overhead Line.
	Bonny Water	Crossed by ZG Overhead Line.

¹¹⁷ Hydrogeology 625K digital hydrogeological map of the UK (2025), British Geological Survey
<https://www.bgs.ac.uk/datasets/hydrogeology-625k/>

Sub catchment	Water Feature	Relevance to the Development
River Kelvin	Forth and Clyde Canal	Crossed by new CB and AA Overhead Line.
	Rowan Tree Burn	Crossed by new CB and AA Overhead Lines.
	Skipperton Burn	Within boundary line of new cables at CB Overhead Line.
	Walton Burn	Crossed by CB route Overhead Line.
	Glencryan Burn	Within boundary line of Cumbernauld Substation.
	Unnamed ponds, ditches and drains	Series of unnamed ponds, ditches and drains which are present throughout the Scoping Boundary.
	Woodend Loch	Within boundary line of Easterhouse Substation.
	Luggie Water	Crossed between XX and CB Overhead Line.
	Cameron Burn	Crossed by proposed new cable between XX and CB Overhead Line.
	Shank Burn	Crossed by proposed new cable between XX and CB Overhead Line.
River Clyde	Unnamed ponds, ditches and drains	Series of unnamed ponds, ditches and drains which are present throughout the Site.
	Gartverrie Burn	Crossed by XX Overhead Line.
	North Calder Water	Crossed by XX Overhead Line.
	Clattering Burn	Tributary of Shotts Burn. Not crossed by cables but within boundary line.
	Shotts Burn	Crossed by XR and XX Overhead Line. Tributary of North Calder Water.
	Legbranock Burn	Crossed by XR Overhead Line.

Sub catchment	Water Feature	Relevance to the Development
	Tillan Burn	Tributary of South Calder Water. Crossed by XR Overhead Line.
	South Calder Water	Crossed by XR Overhead Line.
	Auchter Water	Crossed by XR Overhead Line at three points.
	Unnamed ponds, ditches and drains	Series of unnamed ponds, ditches and drains which are present throughout Scoping Boundary.

The following sections provide further details on the main WFD water bodies associated with the Scoping Boundary.

River Clyde Catchment

South Calder Water (WFD ID: 10072): a river to the east of Glasgow, that flows west for approximately 9.7km, passing beneath the XR Overhead Line before entering the River Clyde via the Strathclyde Loch in Motherwell approximately 8km west of the Development at National Grid Reference (NGR) NS 72881 57749. In 2023, South Calder Water's Overall Status was designated by SEPA as Poor. This status has been the case every year since 2007. Whilst it emanates from a rural plateau near the village of Fauldhouse, much of its course passes through and around urban areas, in particular the towns of Shotts, Newmains, Wishaw and Motherwell. Most chemical parameters were given a WFD Good or Pass by SEPA, but Overall Ecology, Biological Elements and Fish all received a Poor rating. National River Flow Archive (NRFA) data show a Q95 daily flow rate of 0.686m³/s (Q95 is the flow exceeded 95% of the time, as derived from the flow record, and is typical of a dry summer flow).

Tillan Burn (WFD ID: 10750): a river approximately 9.2km in length sourced at the Heatherhead Plantation forested area to the west of Shotts approximately 500m north of the Project. The watercourse then flows west through largely agricultural land and beneath the existing XR route cables before entering South Calder Water 3km south of the Project at NGR NS 78735 57347. The closet tower is at NS 80322 60209 which is approximately 42m from Tillian Burn.

Tillan Burn also has an Overall Status of Poor every year since 2007 including most recently in 2023. Whilst some chemical parameters were deemed Good, the river still had a Poor rating for Overall Ecology, Biological Elements and Fish. There is no NRFA data available for the Tillan Burn.

Shotts Burn (WFD ID: 10070): a 10km river flowing west from agricultural land around the M8 motorway near the village of Kirk of Shotts and passes beneath the motorway at three different points then beneath the existing XR route cables before entering North Calder Water at NGR NS 77684 63811. Much of its course runs through agricultural land, though its lower stretch passes alongside the town of Chapelhall and its confluence at North Calder Water

occurs at the southern extent of Airdrie approximately 1km northwest of the Project. The closest tower is at NS 78758 63269 which is approximately 180m from Shotts Burn.

Shotts Burn also has a Poor Overall Status since 2007 except in 2008 when it was given a Bad Status. It was given a Pass for Specific Pollutants but Poor for Overall Ecology, Biological Elements and Fish. There is no NRFA data available for the Shotts Burn.

North Calder Water (WFD ID: 10062): a river with a length of approximately 19km. It sources at Black Loch at NGR NS 86412 69604 approximately 8km northeast of the Project and flows southwest through Hillend Reservoir and passes beneath the existing XX route cables before entering the River Clyde at NGR NS 67945 61827 approximately 5.7km southwest of the Easterhouse Substation. Its initial stages flow through agricultural land between Black Loch and Hillend Reservoir, but beyond this, the majority of its course passes through urban built environments, in particular the towns of Airdrie and Coatbridge on the eastern side of Glasgow. It passes beneath three motorways along this path - the M8, M73 and M74. The closest tower is NS 78978 65731 which is approximately 59 m from North Calder Water.

Similar to the above watercourses, SEPA designated North Calder Water also with a WFD Overall Status as Poor in 2023 and has been the case since 2007 except in 2008 and 2009, when it was rated as Bad. It was given a Pass rating for Specific Pollutants but is classed as Poor for Overall Ecology, Biological Elements and Fish. NRFA data are available from three monitoring stations along the watercourse: a Q95 daily flow rate of 0.114m³/s is recorded at Hillend, 0.023m³/s at Calderbank and 0.451m³/s at Calderpark.

River Kelvin Catchment

Luggie Water (WFD ID: 10751): an approximately 11.1km long river that flows out of agricultural land southeast of Cumbernauld and flows west beneath the new Overhead Line and into the River Kelvin at NGR NS 65327 74465. Luggie Water's course passes through mixed use land, including open agricultural areas, along the southside of the town of Cumbernauld, beneath the M80 motorway and through the town of Kirkintilloch before its confluence with the River Kelvin. It was designated with a WFD Overall Status of Moderate in 2023, with different ratings – Poor, Moderate and Good – over the years since 2007. Its Overall Status has been Moderate since 2018. Its Overall Chemistry and Specific Pollutants were designated as Pass, with Overall Ecology, Biological Elements and Invertebrate Animals classed as Good and Fish as High. There are two monitoring stations on Luggie Water providing NRFA data, with a Q95 daily flow rate of 0.144m³/s recorded at Condorrat and 0.278m³/s at Oxgang.

River Carron Catchment

Glencryan Burn (WFD ID: 4206): a rivulet that originates at Fannyside Loch south of Cumbernauld and flows west for approximately 3.2km before widening into the Red Burn at NGR NS 77083 74309, approximately 200m west of Cumbernauld Substation. It flows through agricultural land, wooded areas and a golf course before it becomes the Red Burn as it passes beneath a road and a railway line. The Red Burn itself then flows north before entering Bonny Water approximately 3km north of the Project at NGR NS 78552 78514. Glencryan Burn received a WFD rating for its Overall Status of Moderate in 2023 and has been the case since 2008. In 2007, it was rated Good for Overall Status. It was most recently given a Pass for Specific Pollutants and Overall Chemistry, and scored Moderate for Overall

Ecology, Biological Elements and Fish. There is no NRFA data available for the Glencryan Burn, though a monitoring station on the Red Burn at Castlecary records a Q95 daily flow rate of 0.117m³/s.

Bonny Water (WFD ID: 4205): an approximately 11.4km river that flows east between Cumbernauld and Falkirk, crossing ZG Overhead Line before entering the River Carron approximately 400m north of the Development at NGR NS 84499 81450. Much of its course follows the northern bank of the Forth and Clyde Canal and passes through built urban environments including beneath the M80 motorway. The closest tower is NS 84122 81298 which is approximately 37m from Bonny Water.

SEPA designated Bonny Water a WFD Overall Status of Moderate Ecological Potential in 2023. Since 2007, its Overall Status has been designated as either Poor, Moderate or Moderate Ecological Potential. Its current Overall Ecology was rated as Poor, Biological Elements and Invertebrate Animals as Good and Fish as High. The Specific Pollutants measured were all given a Pass. NRFA data from a monitoring station at Bonnybridge show a Q95 daily flow rate of 0.298m³/s.

Forth and Clyde Canal (WFD ID: 3): a river that has been physically altered to the extent that it has now been designated as an artificial water course, a canal which opened to commercial trade in 1790 and was closed to industrial purposes in the 1960s. It runs for a total of approximately 56km allowing navigation between the Firth of Clyde and Firth of Forth. It passes through a range of urban and rural environments along this course, before entering the River Carron at NGR NS 90612 82207, approximately 5.5km east of the Project. The canal crosses the new-built overhead line and the CB route.

The Forth and Clyde Canal received a WFD Overall Status of Good Ecological Potential, which has been the case since 2007. All measured parameters were given Pass or High ratings. No NRFA data is available for the Forth and Clyde Canal.

River Carron (WFD ID: 4201): a large river approximately 40km in length originating in the Campsie Fells. It courses east through the Carron Valley Forest, Carron Valley Reservoir and Carron Glen before passing beneath the M80 and flowing through urban areas such as Denny, Falkirk and Grangemouth and beneath the ZG route cables before entering the Firth of Forth at approximate NGR NS 94586 83970, approximately 9km east of the Project. The closest tower is NS 84175 81601 which is approximately 90m from Bonny Water.

The section of the River Carron of concern here has been designated as WFD Overall Status rating of Poor in 2023 and 2022 and was deemed Moderate in previous years since 2007. The Specific Pollutants received a Pass, but the Overall Ecology, Biological Elements and Fish were all deemed Poor. NRFA data give a Q95 daily flow rate of 0.61m³/s.

Flood Risk

Potential flood risks are identified at different points along the Project. An overview of these is given in Table 8-2

Table 8-2. Flood Risks throughout Development

Design Element	Identified Flood Risks
Denny North Substation	River Flooding None in vicinity. Scoped out. Surface Water Flooding Some areas of Low, Medium and High risk (0.1%, 0.5%, and 10% annual exceedance probabilities) of surface flooding risk within the area of proposed extension and the vicinity of the substation. Coastal Flooding No coastal flooding present. Scoped out.
Bonnybridge Substation	River Flooding A High chance (10% annual exceedance probability) of river flooding presented by Bonny Water within the Scoping Boundary around the substation. Whilst this occurs within the Scoping Boundary, it is not within or adjacent to the proposed extension to the substation itself. Surface Water Flooding A High chance (10% annual exceedance probability) of surface water flooding presented by Bonny Burn within the Scoping Boundary around the substation, and an area of Medium to High flood risk (0.5% to 10% annual exceedance probability) approximately 200m to the east of the substation site within the Scoping Boundary. Whilst this occurs within the Scoping Boundary, it is not within or adjacent to the proposed extension to the substation itself. Coastal Flooding No coastal flooding present. Scoped out.
Cumbernauld Substation	River Flooding No river flooding present within the Scoping Boundary. Scoped out. Surface Water Flooding There are multiple areas of surface water flooding throughout the Scoping Boundary. Thus, has been scoped into the assessment. Coastal Flooding No coastal flooding present. Scoped out.

Design Element	Identified Flood Risks
Easterhouse Substation	River Flooding A High chance (10% annual exceedance probability) of river flooding each year from Woodend Loch adjacent to the south side of the substation.
	Surface Water Flooding A High chance (10% annual exceedance probability) of surface water flooding presented by Woodend Loch adjacent to the south of the site and some smaller areas of Medium to High (0.5% to 10% annual exceedance probability) chance of flooding adjacent to the north side.
	Coastal Flooding No coastal flooding present. Scoped out.
Wishaw Substation	River Flooding None in vicinity. Scoped out.
	Surface Water Flooding A Low to Medium chance (0.1% to 0.5% annual exceedance probability) of surface water flooding each year is present at the western end of the existing site and adjacent to the proposed extension.
	Coastal Flooding No coastal flooding present. Scoped out.
Towers (new and existing)	River Flooding Multiple watercourses crossed by overhead lines present Low, Medium and High river flooding risks (0.1%, 0.5%, and 10% annual exceedance probabilities).
	Surface Water Flooding Multiple areas crossed by overhead lines that present Low, Medium and High surface water flooding risks (0.1%, 0.5%, and 10% annual exceedance probabilities).
	Coastal Flooding No coastal flooding present. Scoped out.

Source: SEPA. Flood Maps Available Online: <https://map.sepa.org.uk/floodmaps>

Hydrogeology

Geology

The Project sits along the Scottish Lower Coal Measures, the Clackmannan Group and the Midland Valley Sill-Complex. Details on bedrock, superficial geology and ground conditions can be found within Chapter 9 Ground Conditions.

Bedrock Hydrogeological Units

Information on hydrological units has been derived from the BGS Hydrogeology 625k digital mapping¹¹⁷.

There are three hydrogeological units underly the entire Project. This includes: The Clackmannan Group, the Scottish Measures Group and an Igneous Intrusion (Carboniferous to Permian). These units will all be scoped into the EIAR stage.

Table 8-3 lists the aquifer units that underlie the relevant elements or parts of the Project.

Both the Scottish Coal Measures Group and the Clackmannan Group are multi-layered aquifers of low yields. There are higher yields where mined, but the water tends to be of poor quality with high iron and fluoride concentrations. They are both classified as a moderately productive aquifer (Class 2B).

The aquifers are both comprised of repetitive sequences of sandstones and siltstones which are interbedded with thinner mudstones, limestones and coal. The thicknesses of the units can up to 3,000m in the Midland Valley¹¹⁸.

Both aquifers are dominated by fracture flow with minor intergranular flow. Groundwater flow paths tend to be long (1 to 10km in length) and are dominated by impacts from historical mining. The depth of flow also tends to be hundreds of meters deep and are mostly concentrated in areas of historic mining. Voids created from mining such as shafts and tunnels can artificially increase the aquifer transmissivity across large areas. They may also link previously unlinked groundwater flow networks¹¹⁸. That can mean the flow path networks can be more complicated than an unmined unit.

The Up-rated Overhead Line (route XR) and the New-build Overhead Line are partially underlain by both the Clackmannan Group and the Scottish Coal Measures Group. The Up-rated Overhead Line (route XX), Easterhouse Substation and Wishaw Substation are all underlain by the Scottish Coal Measures Group. Denny North Substation, Bonnybridge Substation and Cumbernauld Substation are all underlain by the Clackmannan Group.

There is also a low productivity aquifer unit listed as 'unnamed igneous Intrusion (Carboniferous to Permian)'. It has very small amounts of groundwater within the shallow weathered zone and secondary fractures¹¹⁸. It will likely flow in the direction of local surface water catchment¹¹⁸.

The Up-rated Overhead Line (route XX) is underlain by the unnamed igneous Intrusion (Carboniferous to Permian).

¹¹⁸ Scotland's aquifers and groundwater bodies (2015), British Geological Survey & SEPA
<https://www2.bgs.ac.uk/groundwater/waterResources/ScotlandsAquifers.html>

There is no site-specific groundwater level and quantity data. Freely available data will be investigated during the EIAR stage.

Table 8-3 lists which hydrogeological units are scoped into which EIAR. Works at the uprated Overhead Lines have been scoped out of the EIAR.

Table 8-3. Hydrogeological Units

Hydrogeological Units	Project element being Scoped Into
Clackmannan Group	New-build Overhead Line Denny North Substation Bonnybridge Substation Cumbernauld Substation
Scottish Coal Measures Group	New-build Overhead Line Easterhouse Substation Wishaw Substation

Superficial Hydrogeological Units

The majority of the Scoping Boundary area is overlain by the following superficial deposits (please refer to Figure 9.1):

- Till, Devensian-diamicton, which is glaciogenic in origin and is situated throughout the Scoping Boundary;
- Peat Deposits;
- Alluvium-clay, silt, sand and gravel, which are situated around the Lochs and rivers include the River Clyde, and the Forth and Clyde Canal;
- Glaciolacustrine Deposits - build of clay silt and sand situated around the course of the River Clyde and the Forth and Clyde Canal; and
- Glaciofluvial ice contact deposits-gravel, sand and silt situated mostly around the River Clyde and the Forth and Clyde Canal.

There is no information freely available online concerning superficial aquifers, however, it is highly likely that some of the superficial deposits of sands and gravels will hold small volumes of water. At this stage, there is not enough information to scope out potential impacts on the superficial aquifers and therefore they will be considered for the EIAR. However, due to the minimal work required at the uprated Overhead Lines, superficial aquifers have been scoped out of the EIAR for the uprated Overhead Line Project elements.

WFD Designations of Groundwater

There are seven WFD groundwater bodies found across the Scoping Boundary. These are listed in Table 8-4 along with the relevant elements of the Project and EIARs.

Table 8-4. WFD Groundwater Bodies

ID and Name	WFD Status	Project Elements Scoped in/out of EIAR
Denny (ID 150514)	Poor (2023)	New-build Overhead Line and Denny North Substation

Castle Cary (ID 150560)	Good (2023)	New-build Overhead Line, Cumbernauld Substation and Denny North Substation
Carron Sand and Gravel (ID 150774)	Good (2023)	Scoped Out (Upated route only)
Kirkintilloch (ID 150616)	Poor (2023)	New-build Overhead Line, Upated Overhead Lines and Cumbernauld Substation
Falkirk (ID 150511)	Poor (2023)	New-build Overhead Line
Slamannan (ID 150546)	Poor (2023)	Scoped Out (Upated route only)
Glenboig (ID 150436)	Good (2023)	Scoped Out (Upated route only)
Glasgow and Motherwell (ID 150677)	Poor (2023)	New-build Overhead Line, Upated Overhead Lines, Wishaw Substation and Easterhouse Substation
Whitburn (ID 150509)	Poor (2023)	Scoped Out (Upated route only)

Drinking Water Protected Areas

Groundwater Drinking Water Protected Areas are areas that have been defined by SEPA in line with the requirements of The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013 to fulfil the requirements of the WFD. These are areas where land use is causing pollution of the raw water and action is being undertaken to reduce this risk and the need for extra water treatment. All the WFD bodies listed within Table 8-4 are considered as Drinking Water Protected Areas.

Groundwater Dependant Terrestrial Ecosystems

Groundwater Dependent Terrestrial Ecosystems (GWDTE) are ecosystems which rely upon groundwater for their existence. These ecosystems can be associated with wetlands, springs, rivers, lagoons, etc. More information and assessment on GWDTE can be found within Chapter 7 Biodiversity.

Potential GWDTE will be identified by the Biodiversity specialist's Phase 1 Habitat review, supplemented by a National Vegetation Classification (NVC) survey where relevant. The EIAR Ecology and Biodiversity Chapter will report areas of potential GWDTE.

The hydrogeological linkage between potential GWDTE and the working areas of the Project will be assessed within the EIAR Water Environment chapter. This will assess any potential impact pathways associated with disruption of supply and/or quality within the hydrology and groundwater assessment. Secondary impacts to the habitat will be considered within the EIAR ecology and biodiversity assessment.

Coal Mining

Almost the entirety of the Scoping Boundary is within a coal mining reported area¹¹⁹. Within this area, there are also significant areas of surface coal resources, surface mining (past and current), mine entries, past shallow coal mine workings, probable shallow coal mine workings and development high risk areas.

¹¹⁹ Mining Remediation Authority Map Viewer (2025), Mining Remediation Authority <https://datamine-cauk.hub.arcgis.com/>

Private Water Supplies

In Scotland, PWS are defined as potable supplies that are not provided by the mains water provider (Scottish Water). They may be surface water abstractions, or abstractions from groundwater via wells, boreholes and springs. As private supplies, the only treatment of the supply will be via any facilities installed and maintained by the owner of the supply or those that benefit from the supply.

PWS serving domestic premises with less than 50 inhabitants are regulated by the Private Water Supplies (Scotland) Regulations 2006. This legislation states that all PWS must be registered with their local authority.

The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017 aims to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that the water meets water quality standards.

Both the Clackmannan Group and the Scottish Measures Group have the potential to serve PWS in the area. It is expected that PWS may exist in rural areas not served by mains water supplies. In the case of the area around the Project, it is expected that several of the rural properties may have their own water supplies, either from boreholes, wells or springs. A request will be made to FC and NLC for information held on PWS within the area.

At the time of the assessment, no information on licenced water abstractions was available. The location and data on licenced abstractions will be requested from SEPA and considered in the EIA.

An assessment of impacts on PWS will be scoped out of the EIAR unless information provided from the local authorities and SEPA confirm nearby abstractions.

Other Designations

There are several designations which will also be considered within the EIAR (See Figure 8.1 and Figure 8.2).

New-build Overhead Line

The New-build Overhead Line has several SSSI including Howiering Muir, North Bellstane Plantation and West Fanny Side Moss.

There is also the Slamannon Plateau SPA and an SAC called West Fanny Side Moss. The SAC coincides with a small part of the SPA.

Upgraded Overhead Lines

The Woodend Loch and Bishop Loch SSSIs are located to the south and east respectively of the existing XX overhead line.

There are no designated areas within 1km of Overhead Line route ZG or XR.

Easterhouse Substation

Woodend Loch SSSI is located directly to the south of Easterhouse Substation.

8.3 Identification of Potential Effects

Construction

Groundwater and Surface Water Quality Impacts

During the construction phase, there is the potential for adverse effects on the water environment. These may arise due to chemical contamination and sedimentation of water features. Impacts on aquatic habitats by fine sediment in runoff (including the potential wash out of fine sediment from temporary spoil heaps, dams, and access tracks), chemical spillages, and physical changes to water features may occur. These impacts may occur as a result of construction works, including but not limited to:

- Works directly within, under and adjacent to water features;
- Construction of temporary access tracks that may require crossings of watercourses;
- Increased areas of hardstanding and bare ground which could cause sediment-laden runoff;
- Excavations and dewatering for foundation purposes (limited to new build and some substation works); and
- Other general construction activities (e.g. stripping of vegetation, fuel spills, movement of plant and possible batching of concrete etc.).

Without appropriate mitigation, significant residual effects could adversely affect the natural attributes of the water features, WFD status, and potentially any socio-economic uses of water features (e.g. commercial fisheries and any potential surface water PWS).

The impacts listed above are applicable for the New-build Overhead Line and the Cumbernauld Substation.

For the project elements where there is less construction works occurring such as at Upgraded Overhead Lines, Denny North Substation, Bonnybridge Substation, Easterhouse Substation and Wishaw Substation risks of impacts to the water environment are significantly reduced but are not completely removed.

Groundwater Quantity Impacts

Groundwater quantity impacts could occur during the foundation construction for the Cumbernauld Substation and the New-build Overhead Line. Dewatering may be required for foundation construction. This could temporarily redirect groundwater from the underlying aquifers, PWS, GWDTE and other abstractions should they be present.

Sections of AA route will require undergrounding where it crosses the New-built Overhead Line. This may also require temporary dewatering during construction.

Groundwater is likely to be present in the superficial deposits at shallow depths, although the extents of these deposits are limited. This water will potentially be hydraulically linked to surface watercourses and groundwater fed habitats. Any disruption to the shallow groundwater may therefore have wider effects, which may also be significant. Information from the NVC survey will be used to identify the presence of any potentially GWDTEs. By avoiding the most sensitive sites in ecological terms, it may also be possible to reduce the significance of any effects.

Operation

Due to the nature of the Project, the potential for operational phase impacts on the water environment are expected to be very limited. Surface water runoff from any above ground installations such as the new Cumbernauld Substation, can be managed through the use of Sustainable Drainage Systems (SuDS) or proprietary treatment measures.

Where there are surface water discharges to watercourses, it is recommended that the final connection is via new ditch, although if engineered outfalls are required, some bank habitat would be lost.

The new and uprated Overhead Lines will be scoped out of operation. This is due to the minimal impact caused to the water environment during operation.

8.4 Assessment Methods

Planned Surveys

A site walkover survey is proposed focusing on those watercourses and water features that may be directly impacted by the Project. This will include proposed watercourse crossing points or other works that may directly affect watercourses.

The survey will confirm flow pathways and connections and make observations about the hydromorphology and water quality of water features. It will also make general observations about land use, topography and any other potential sources of impact, channel modifications, or uses as are relevant to the impact assessment.

The results of the survey will inform the determination of receptor importance and the risk to the receptor from the Project. No water quality monitoring or other field data collection is proposed at this stage as it is believed that there will be sufficient information to categorise the importance of the water receptors. However, it is possible that water quality monitoring may be recommended as mitigation during construction.

Water Environment Impact Assessment

Baseline Desk Study

Further desk study will be undertaken of readily available data from online sources providing information on local climate, topography, soils, hydrogeology, and land use. In addition, a data request will be made to SEPA regarding any relevant hydrological, water quality, water resource and aquatic ecology data that they hold, and to NLC and FC for information on any known local PWS. Further data requests and consultations will be made to other third parties where necessary. A gap analysis will be undertaken to determine the need for any additional data collection and any further surveys that may be required. If further surveys are required, the scope of these would be agreed with the relevant stakeholders. However, at this stage it is assumed that adequate data would be available from the desk study and a site walkover.

Consultation

As the EIA is progressed, it is proposed to consult directly with key stakeholders regarding the scope and outcomes of the Water Environment Impact Assessment and associated studies (i.e. PWS assessment and WFD assessment). Key stakeholders relevant to this assessment include: SEPA, NLC and FC, and potentially NatureScot and Scottish Water.

Source-Pathway-Receptor Approach

The identification of impacts will be undertaken using the source-pathway-receptor model. This model identifies the potential sources or 'causes' of impact as well as the receptors (e.g. surface water resources) that could potentially be affected. The presence of a potential impact, source and a potential receptor does not always infer an impact will occur; there needs to be an impact pathway or 'mechanism' via which the source can have an impact on the receptor. The assessment will be primarily qualitative and informed by the existing data and information collected as part of surveys, site visits and stakeholder consultations.

Determining the Significance of Effects

The criteria proposed to determine the significance of effects on receptors where there is an impact source and pathway are presented in **Error! Reference source not found.**, Table 8-6 and

Table 8-7. Firstly, the importance of the receptor is determined with reference to the criteria in **Error! Reference source not found.**. Then, independently from the receptor's importance, the magnitude of the impact is determined from the criteria in Table 8-6. Impacts may be adverse/beneficial/negligible (i.e. an imperceptible effect or no effect to a water resources receptor), direct/indirect, temporary/permanent, apply over short (endures for up to 12 months after construction or decommissioning), medium (endures for 1-5 years) and long (endures for more than 5 years) time periods. The likelihood of the impact occurring is also considered at this stage based on a scale of certain, likely or unlikely.

The receptor importance and the magnitude of impact are then combined using the matrix presented in

Table 8-7 to determine the overall significance of the effect. Effects that are moderate or worse once any mitigation has been taken into account are considered significant.

The approach is based on the criteria presented in the Design Manual for Roads and Bridges (DMRB) LA 113 Road drainage and the Water Environment¹²⁰, adapted to include hydromorphology. Although developed initially for road schemes, the criteria are independent of the development type and represents a nationally accepted and robust approach to the determination of likely significant effects on the water environment. The precautionary principle is also applied to the assessment where necessary.

¹²⁰ DMRB LA 113 - Road drainage and the water environment (2020), Standards for Highways
<https://www.standardsforhighways.co.uk/search/d6388f5f-2694-4986-ac46-b17b62c21727>

Table 8-5 Receptor sensitivity descriptors

Importance	Groundwater	Surface Water	Hydromorphology
Very High	Aquifer providing a regionally important resource and/ or supporting a site protected under International and UK legislation Ecology and Nature Conservation. Groundwater locally supports GWDTE.	Watercourse having a WFD classification shown in a RBMP and $Q95 \geq 1.0 \text{ m}^3/\text{s}$ Site protected/ designated under International or UK habitat legislation (SAC, SPA, SSSI, Water Protection Zone (WPZ), Ramsar site. International Designated Salmonid/ Cyprinid fishery. Species protected by international legislation.	Unmodified, near to or pristine conditions, with well-developed and diverse geomorphic forms and processes characteristic of river and loch type. Varied morphological features with no sign of channel modification. Typology is highly sensitive to morphological change (active or passive meandering types) Displays natural fluvial processes and natural flow regime, which would be highly vulnerable to change as a result of modification.
High	Aquifer providing locally important resource or supporting river ecosystem and/ or supporting sensitive habitats of national importance. Groundwater supports a GWDTE.	Watercourse having a WFD classification shown in a RBMP and $Q95 < 1.0 \text{ m}^3/\text{s}$. Major Cyprinid Fishery. Species protected under International or UK legislation Ecology and Nature Conservation.	Conforms closely to natural, unaltered state and will often exhibit well-developed and diverse geomorphic forms and processes characteristic of river and loch type. Deviates from natural conditions due to direct and/ or indirect channel, floodplain, bank modifications and/ or catchment development pressures. Typology is sensitive to morphological change (plane-riffle, braided or wandering). Diverse range of fluvial processes that is highly vulnerable to change as a result of modification.
Medium	Aquifer providing water for agricultural or industrial use with limited connection to surface water. Secondary Aquifer. Groundwater of limited value because its quality does not allow potable or other quality sensitive uses.	WFD not having a WFD classification shown in a RBMP and $Q95 > 0.001 \text{ m}^3/\text{s}$.	Shows signs of previous alteration and/ or flow/ water level regulation but still retains some natural features or may be recovering towards conditions indicative of the higher category. Exhibits some morphological features. The channel cross-section is partially modified in places, with obvious signs of modification to the channel

Importance	Groundwater	Surface Water	Hydromorphology
			morphology. Natural recovery of channel form may be present (e.g. eroding cliffs, depositional bars). Typology is moderately sensitive to morphological change (step-pool or plane bed). Some natural fluvial processes, including varied flow types. Modifications and anthropogenic influences having an obvious impact on natural flow regime, flow pathways and fluvial processes.
Low	Unproductive Strata	Watercourses not having a WFD classification shown in a RBMP and $Q_{95} \leq 0.001 \text{ m}^3/\text{s}$.	Substantially modified by past land use, previous engineering works or flow/ water level regulation. Watercourses likely to possess an artificial cross-section (e.g. trapezoidal) and will probably be deficient in bedforms and bankside vegetation. Watercourses may also be realigned or channelised with hard bank protection, or culverted and enclosed. May be significantly impounded or abstracted for water resources use. Could be impacted by navigation, with associated high degree of flow regulation and bank protection, and probable strategic need for maintenance dredging. Artificial and minor drains and ditches will fall into this category. Highly modified sediment regime with limited/no capacity for natural recovery. Extensively modified (e.g. by culverting, addition of bank protection or impoundments) and exhibits limited-to-no morphological diversity. The water feature is likely to have uniform flow, uniform banks and absence of bed features. Insufficient energy for morphological change.

Importance	Groundwater	Surface Water	Hydromorphology
			Typology is moderately sensitive to morphological change (bedrock or cascade). Shows no or limited evidence of active fluvial processes with unnatural flow regime or/and uniform flow types and minimal secondary currents.

Table 8-6 Criteria to determine magnitude of effect

Impact Category	Description
High Adverse	Results in a loss of attribute and/or quality and integrity of the attribute
Medium Adverse	Results in impact on integrity of attribute, or loss of part of attribute
Low Adverse	Results in some measurable change in attribute's quality or vulnerability
Negligible	Results in impact on attribute, but of insufficient magnitude to affect the use or integrity. The Scheme is unlikely to affect the integrity of the water environment
Low Beneficial	Results in some beneficial impact on attribute or a reduced risk of negative impact occurring
Medium beneficial	Results in moderate improvement of attribute quality
High beneficial	Results in major improvement of attribute quality

Table 8-7 Matrix to determine significance of effect

Magnitude	Importance			
	Very High	High	Medium	Low
High	Major	Major	Moderate	Moderate
Medium	Major	Moderate	Moderate	Minor
Low	Moderate	Moderate	Minor	Negligible
Negligible	Minor	Minor	Negligible	Negligible

Private Water Supply Assessment

Information on any known PWS within 1km of the Project, temporary works or permanent above ground facilities will be requested from NLC and FC during the impact assessment stage. This data will be screened to short list any PWS that may be at risk of disruption during the construction of the Project.

Each PWS that is identified in this category will be visited and the owners/occupiers asked to complete a short questionnaire to gather basic information about the supply. This will include what it is used for, and whether they have access to a mains potable supply as well.

A qualitative risk assessment will then be undertaken based on the questionnaire responses. The assessment will take into account a number of factors around the 'source-pathway-receptor', before a groundwater risk assessment is carried out using the guidance published by SEPA, Guidance on Assessing the Impacts of Developments on Groundwater Abstractions¹²¹. This will inform the impact assessment and the development of possible

¹²¹ Guidance on Assessing the Impacts of Development on Groundwater Abstractions (2024), SEPA [guidance-on-assessing-the-impacts-of-developments-on-groundwater-abstractions.docx](#)

mitigation measures such as water quality monitoring or if necessary, a temporary alternative supply.

Water Framework Directive Assessment

The Project must not cause deterioration of the status of or any relevant WFD parameter or prevent the improvement to meet future WFD objectives of any affected WFD designated water body. This includes water features that are within the catchment of the designated WFD water bodies but that are themselves not designated as a water body in their own right.

A WFD assessment will be prepared to support the impact assessment, Section 37 applications, and Town and Country Planning applications. The WFD assessment will be undertaken in two stages: Screening and Scoping, and if required, a full or detailed assessment.

The aim of the preliminary stage of assessment is to screen and scope the potential for non-compliance as a consequence of the Project. This would be based on gathering and evaluating existing data and determining qualitatively the potential for non-compliance with WFD objectives for the various designated water bodies within the study area.

The assessment will consider biological, physico-chemical (water quality) and hydromorphological (physical) elements, for surface water and groundwater bodies at the Site of interest, and for connecting waterbodies. It will also consider the objectives of any Protected Areas and mitigation measures proposed by SEPA to improve water body status.

The need for further, more detailed assessment will be determined in consultation with statutory consultees (i.e. SEPA) following completion of the Screening and Scoping WFD Assessment.

Flood Risk Assessment

Individual flood risk assessments will be carried out for the five substation locations. These will be included as an appendix to the Environmental Impact Assessment Report and summarised within the technical chapter.

Flood risk will be assessed in three phases using CIRIA Document C624:

- Level 1: Screening study to identify flooding issues related to the site which may warrant further consideration.
- Level 2: Scoping study to confirm possible sources of flooding that may affect the site.
- Level 3: Detailed study to be undertaken if the Level 2 assessment concludes that quantitative analysis is required to assess fully the flood risk issues related to the development site.

The following is required for each of the substations:

- Wishaw – Level 3 detailed study
- Easterhouse – Level 1 screening study
- Cumbernauld – Level 3 detailed study
- Bonnybridge – Level 1 screening study
- Denny North – level 3 detailed study

The detailed design of each substation will be informed by the flood risk assessments studies described above where appropriate. It is assumed that the detailed design of each substation will ensure the designs will not increase the risk of flooding elsewhere and would themselves be resilient to the 1 in 200 year flood event (plus appropriate climate change factor). Therefore, at this time no significant effects in relation to flooding are anticipated. All flood risk assessments undertaken will be appended to the EIAR. The EIAR will explain what is required of the detailed design to make sure the designs will not increase the risk of flooding elsewhere, and ensure they are resilient to the 1 in 200-year flood event (plus appropriate climate change factor).

8.5 Summary of Proposed Scope

The Project has the potential to have direct and indirect water quality, flood risk, hydrogeological and hydromorphological adverse impacts. The impacts are predominantly associated with the construction phase, although the management of surface water runoff from above ground installations, substations and towers can result in permanent but localised impacts to any receiving watercourses. However, through iterative design and the establishment of robust mitigation, management and monitoring strategies, the potential for significant environmental effects can be effectively avoided, minimised and reduced.

Overall, a Water Environment Impact Assessment will be included in the Environmental Impact Assessment Report covering potential impacts on surface water and groundwater receptors, including water quality (all substations and new-built and uprated overhead lines), water resources (new-built and uprated overhead lines and all substation) and hydromorphology (Cumbernauld Substation and new-built and uprated overhead lines), as well as flood risk (all substations). This will include details of proposed mitigation or environmental enhancement measures, stating the residual effects.

The impact assessment will also be supported by a PWS Risk Assessment, Flood Risk Assessment (FRA) and a WFD assessment. The WFD assessment will consider the potential for deterioration or prevention of improvement in the status of WFD water bodies that are potentially affected by the Project. At this stage, it is only proposed that a preliminary screening and scoping level of assessment will be carried out, with the need for further assessment to be determined at a later stage through consultation with stakeholders.

Table 8-8 provides a summary of the Project Components where Water Environment is scoped in, in relation to Construction and Operational phases.

Table 8-8 Summary of Proposed Scope – inclusion of Water Environment Topic within EIARs

Project Component	Phase	Water Environment Topic Scoped in / out?	Rationale (only where Topic is scoped out)
New-build overhead line	Construction	Scoped in	
	Operation	Scoped out	The operation/routine maintenance activities will involve small-scale works
Up-rated overhead line (ZG Route)	Construction	Scoped in	
	Operation	Scoped out	As above
Up-rated overhead line (XX Route)	Construction	Scoped in	
	Operation	Scoped out	As above
Up-rated overhead line (XR Route)	Construction	Scoped in	
	Operation	Scoped out	As above
CB Route Removal and AA Route Ungrounding	Construction	Scoped in	
	Operation	Scoped out	As above
Denny North Substation	Construction	Scoped in	
	Operation	Scoped out*	As above
Bonnybridge Substation	Construction	Scoped in	
	Operation	Scoped out*	As above
Cumbernauld Substation	Construction	Scoped in	
	Operation	Scoped out*	As above
Easterhouse Substation	Construction	Scoped in	
	Operation	Scoped out*	As above
Wishaw Substation	Construction	Scoped in	
	Operation	Scoped out*	As above

* A stand-alone Flood Risk Assessment will be submitted for each substation.

09.

Geology and Soils

9. Geology and Soils

9.1 Introduction

This chapter sets out the proposed scope and methodology of the EIAR assessment of effects on Geology and Soils as a result of the Project. The information provided within this chapter is based on publicly accessible data at the time of writing.

This chapter presents the baseline within the Scoping Boundary as a whole, from Denny North Substation in the north, following the route of the new-build OHL and existing OHLs to be uprated in the south, encompassing Bonnybridge, Cumbernauld and Easterhouse Substations before terminating at Wishaw Substation.

9.2 Relevant Legislation, Policy and Guidance

This scoping exercise has followed the most recent edition of Design Manual for Roads and Bridges (DMRB) LA190, Geology and Soils¹²². There is no specific guidance in relation to transmission infrastructure for assessing soils and geology. The methodology presented within DMRB LA190 is considered the most appropriate methodology for this scoping exercise, because LA190 is designed for assessing effects of linear schemes.

Other relevant guidance considered applicable and pertinent to the Geology and Soils topic include, but are not limited to:

- Good Practice for Risk Assessment for Coal Mine Gas Emissions (2021)¹²³;
- CO₂ Mine Gas - Site Investigation and Risk Assessment: Best Practice (2024)¹²⁴;
- BS 10175 (2011 + A2 2017), Investigation of Potentially Contaminated Sites - Code of Practice [18]¹²⁵;
- Environmental Good Practice on Site C811D 5th Edition (2023)¹²⁶;
- Land contamination risk management (LCRM) (2020, updated 2023)¹²⁷;
- Land Contamination and Development, Guidance for assessing and addressing land contamination issues to meet the requirements of Contaminated Land regulators in Scotland, Version 2.12 (2019)¹²⁸;
- Contaminated Land Risk Assessment. A Guide to Good Practice C552 (2001)¹²⁹;

¹²² Design Manual for Road and Bridges Volume 5, Section 1, Part 2, TD 36/93, Scheme Assessment Reporting (1993) National Highways <https://nationalhighways.co.uk/suppliers/design-standards-and-specifications/design-manual-for-roads-and-bridges-dmrbl/>

- Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66, 2008¹³⁰; and
- BS EN 1997-1:2004 + A1:2013, Eurocode 7 – Geotechnical Design – General Rules¹³¹.

9.3 Baseline Conditions

The British Geological Survey (BGS) GeoIndex¹³² presents the superficial and bedrock geology associated with the Scoping Boundary.

Important features of relevance to Geology and Soils within and adjacent to the Scoping Boundary are shown in Figures 9.1 to 9.5 (Appendix A). These are outlined in greater detail below.

Superficial Deposits

This section describes superficial deposits as mapped within the BGS 1:625,000 and 1:50,000 scale Superficial deposits mapping.

The Scoping Boundary is underlain by superficial deposits broadly varying between alluvial deposits, raised marine deposits, glacio-fluvial deposits, glaciogenic deposits (till) and organic peat¹³³ deposits. Figure 9.1 (Appendix A) details the superficial geology at a 1:625,000 scale.

As shown by the 1:625,000 and 1:50,000 BGS mapping from the north of the Scoping Boundary surrounding Denny North Substation, the superficial deposits typically comprise peat and till (Devensian) moving into raised marine deposits and alluvial deposits (comprising clay, silt, sand and gravel) beyond Bonnybridge Substation. The remainder of the Scoping Boundary is typically underlain by superficial deposits of till interspersed with areas of peat. There is an area of glaciofluvial ice contact deposits (gravel, sand and silt) recorded where XX route crosses the A71. At Wishaw Substation, glaciolacustrine deposits (clay, silt and sand) are recorded.

Made ground (artificial deposits) is indicated on the BGS mapping within the Scoping Boundary. Made ground is shown at various locations along the Scoping Boundary and adjacent to the substations. Given the highly industrial nature of the central belt and the historical development of the area, made ground is anticipated in areas associated with towns, roads and other infrastructure along the Scoping Boundary.

Solid Geology

There are variable Carboniferous to Permian bedrock geologies beneath the Scoping Boundary, crossing multiple rock formations belonging to the Clackmannan Group and Scottish Coal Measures Group, with occasional igneous rock intrusions (see Figure 9.2 in Appendix A).

From the north of the Scoping Boundary at Denny North Substation, the bedrock geology comprises the Upper Limestone Formation, moving into the Passage Formation, comprising

¹³² GeoIndex (onshore), (n.d.) British Geological Survey

https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.125906253.1347877745.1739891726-828666299.1739891726

¹³³ The BGS Superficial deposits 1:625,000 scale mapping defines peat as: partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps.

sandstones and seatearths, with outcrops of quartz-microgabbro dykes of the Central Scotland Late Carboniferous Tholeiitic Dyke Swarm.

Around High Bonnybridge, the bedrock geology comprises the Scottish Lower Coal Measures Formation, comprising sandstone, siltstone and mudstone within common coal seams, passing back into the Passage Formation at South Drum to Cumbernauld Substation. Between Cumbernauld Substation and Easterhouse Substation, the underlying bedrock comprises the Upper Limestone Formation to Wester Glentore where the Scottish Lower Coal Measures Formation is recorded with intrusions of the Midland Valley Sill-Complex comprising quartz-microgabbro.

At Easterhouse Substation, geology of the Scottish Middle Coal Measures Formation is noted. Between Stand and Wishaw Substation, the Scoping Boundary remains within geological cycles of the Scottish Coal Measures Group and the Midland Valley Sill-Complex, with the Passage Formation adjacent to the Heatherhead Plantation. The remainder of the Scoping Boundary is underlain by the Scottish Lower and Middle Coal Measures.

Numerous coal seams (inferred) and faults (inferred) of unknown displacements are recorded along the Scoping Boundary. As shown on Figure 9.2 (Appendix A), the Scoping Boundary crosses seven geological faults, with both Easterhouse and Bonnybridge substations falling within proximity to a geological fault.

Mining and Quarrying

The Mining Remediation Authority (MRA) Interactive Map¹³⁴ was reviewed to understand the risk relating to the Scoping Boundary. This source indicates that the Scoping Boundary is within a Coal Mining Reporting Area (CMRA). Historical mining activities are recorded across large areas of the Scoping Boundary, with extensive records of workings and mine entries towards the south. Information from the MRA is shown on Figure 9.3 (Appendix A). The following information was also obtained from the viewer:

- A large portion of the New-build Overhead Line and Upgraded Overhead Lines, and Easterhouse Substation are within a Development High Risk Area (DHRA). DHRA's are associated with recorded mine entries, areas of former surface mining, recorded and probable past shallow (<30m Below Ground Level) mine workings and outcrops;
- There are recorded mine entries in close vicinity to the Scoping Boundary in several locations, notably around Bonnyhill Farm and to the northeast of this, north of Birchwood Farm, at Boglea Farm, between Riggend and Glenmavis, south of Glenboig and in numerous locations along the XR route and XX route in the southern half of the Scoping Boundary between Holehills and Wishaw. The records include both adits and shafts. No mine entries are recorded within close proximity of substations;
- There are multiple areas of past surface mining located along the Scoping Boundary. These are three areas between High Bonnybridge and Camelon, two areas north and west of Wattston, one area south of Moffat Mills, five areas north and east of Newarthill and five areas between Morningside and Waterloo. There are no areas of former surface mining recorded in close proximity of the substations;

¹³⁴ Mining Remediation Authority Map Viewer, (2023) Mining Remediation Authority <https://datamine-cauk.hub.arcgis.com/>

- There are former recorded shallow mine workings beneath isolated areas to north of the Scoping Boundary, beneath a significant portion of the New-build Overhead Line north of Glenmavis and through much of the remainder of the route between Holehills and Wishaw. There are no areas of former recorded shallow mine workings in the close vicinity of the substations; and
- There are coal and other mineral outcrops, and associated probable shallow coal mine workings, beneath significant portions of the Scoping Boundary. A coal outcrop is recorded at Easterhouse Substation. A DHRA is associated with this coal outcrop and probable shallow mine workings along the same coal outcrop to the east of the substation. Limestone outcrops are recorded at Denny North Substation and Cumbernauld Substation. To the north of Cumbernauld Substation there are probable shallow mine workings along the same limestone outcrop present at Denny North Substation and Cumbernauld Substation.

A review of the National Library of Scotland (NLS) Side-by-Side viewer¹³⁵ was undertaken to provide a high-level understanding of the mining related history within the Study Area. The mining related history is extensive. Coal mines, old coal pits, ironstone pits, disused ironstone pits, lime kilns, old lime kilns, quarries, ironworks, brick works, tile works, fireclay and pottery works were also present in the vicinity of the Scoping Boundary on the earliest mapping series (1830s to 1800s). There are numerous named collieries, ironworks and fireclay works present within the vicinity of the Scoping Boundary on the various mapping series. Large former mineral railway networks relating to the mine workings were also recorded, particularly across the southern half of the Scoping Boundary.

A review of the Mine and Quarries layer of the BGS Geoindex was undertaken to understand the potential mining and quarries which may be present along the Scoping Boundary. This source indicates numerous mines and quarries inside the Scoping Boundary, and within its vicinity. There are no features recorded at substation locations, however several features are recorded in the vicinity of the substations. There are a large number of features inside the Scoping Boundary, and within close proximity of XX route and XR route.

Entries relate to quarries, mines, shafts and opencast sites with commodities noted to include coal, ironstone, fireclay, flagstone, gravel and sand. There are several fireclay mines and shafts noted in the general vicinity around Cumbernauld Substation. All the mines and quarries recorded by the BGS in the close vicinity of the Scoping Boundary are noted to have ceased operations.

Soils

The soil maps for Scotland are available at the Scotland's Environment website¹³⁶. Soils along the route vary. Within the north at Denny North Substation, the soil is described as peat (organic soils). The Scoping Boundary passes into peaty gleys and mineral gleys, described as being very poorly drained and imperfectly drained respectively. The Scoping Boundary stays within mineral gleys with areas of brown soils (freely drained) in areas. The soil becomes alluvial and brown soils (both freely drained) within the vicinity of the River Carron. Beyond the

¹³⁵ Side by side georeferenced maps viewer, (n.d.) National Library of Scotland <https://maps.nls.uk/geo/explore/side-by-side/#zoom=5.0&lat=56.00000&lon=-4.00000&layers=1&right=ESRIWorld>

¹³⁶ Map, (n.d.) Scotland's Environment <https://map.environment.gov.scot/sewebmap/>

Forth and Clyde Canal, the soil becomes a mineral podzol (freely drained), before re-entering mineral gleys at Bonnyhill Farm. Areas of made ground are recorded within this area, described as open cast restored ground. The route continues in the mineral gleys, entering pockets of organic soils and peaty gleys until closer to the Cumbernauld Substation, where a large area of organic soils is encountered. Cumbernauld Substation is recorded to be within an area of made ground. Between Cumbernauld Substation and both Easterhouse and Wishaw Substations, the majority of the route remains within mineral gleys, organic soils, and peaty gleys with areas of made ground. Wishaw Substation is recorded to be in an area of built-up land where there is no soil data available.

The BGS GeoIndex records three areas of peat along the Scoping Boundary. There are two areas of peat between Cumbernauld Substation and south of Bonnybridge Substation, with the larger of the two closer to Cumbernauld Substation. A third area of peat is recorded in and around Easterhouse Substation. These deposits are shown on Figure 9.4 (Appendix A).

NatureScot has produced a Carbon and Peatland map in 2016¹³⁷ which identifies carbon rich soil, deep peat and priority peatland habitats (see Figure 9.4 in Appendix A). This map splits the carbon and peatland soil into six classes (Class 0 to 5) describing the significance of the peatland / carbon soil, with Class 1 being the most significant and important and Class 5 being the least significant. Class 0 was also used to describe mineral soils. The map indicated the following:

- The majority of the site falls within Class 0 (*mineral soils*);
- There are two localised areas of Class 1 (*national important carbon-rich soils, deep peat and priority peatland habitat which are likely to be of high conservation value*) soils present beneath the New-build Overhead Line to the east of Cumbernauld Substation. The larger of the two areas is located north of Old Shields;
- There are localised areas of Class 3 (*dominant vegetation cover is not a priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat*) soils within the north of the site. These are beneath the New-build Overhead Line east of Cumbernauld Substation and beneath a small portion of Denny North Substation;
- There is one localised area of Class 4 (*area unlikely to be associated with peatland habitats or wet and acidic type*) soils adjacent to Denny North Substation and beneath the Scoping Boundary between Cumbernauld Substation and Bonnybridge Substation; and
- There are numerous localised areas of Class 5 (*soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat*) soils throughout the Scoping Boundary, particularly in the northern half. These are predominantly beneath the New-build Overhead Line, and Uprated Overhead Lines, but also beneath Denny North Substation and a small portion of Easterhouse Substation.

¹³⁷ Carbon and Peatland 2016 Map, (2016) NatureScot
https://opendata.nature.scot/datasets/171df29c8c5b45a9b93438a3bc5700c6_0/explore

Agricultural Soils

Agricultural soils are discussed within the Land Use, Forestry and Agriculture Chapter (Chapter 18).

Land Contamination

Where land has been impacted by waste and residues from former or current industrial processes, the presence of toxic or other hazardous material may pose threats to human health or impose other constraints, should it require excavation or avoidance. The National Library of Scotland's historical ordnance survey maps¹³⁸ have been reviewed and indicate the presence of potential current and historical contaminative sources within the Scoping Boundary. These sources include:

- Railway Lines – Scottish Central Main Line, Edinburgh to Glasgow via Falkirk Line, Monkland and Kirkintilloch Railway, Caledonian Railway. Potential contaminants include hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), metals, asbestos;
- Electrical Substations – Denny North, Bonnybridge, Cumbernauld, Easterhouse and Wishaw Substations all have the potential to have caused contamination including hydrocarbons, polychlorinated biphenyls (PCBs);
- Historical quarries and mining activities. Various potential contaminants may be present including metals, hydrocarbons, asbestos;
- The use of parts of the Scoping Boundary as agricultural land. Potential contaminants may include pesticides; and
- Existing roads. Contaminants may include metals, hydrocarbons and coal tars.

Sources also include former industrial activities within the vicinity of the Scoping Boundary, such as Caldervale Print Works, Moffat Paper Mill, Chapelhall Iron Works, Pather Iron and Steel Works, Rawyards Factory. Contaminants will vary depending on the nature of the works but may include hydrocarbons, per- and polyfluoroalkyl substances (PFAS), polycyclic aromatic hydrocarbons (PAHs), metals and asbestos. The desk studies will identify potential sources of contamination (within and outside the Scoping Boundary), identify potential pathways and receptors based on the recorded ground conditions and proposed development, and identify potential risks within preliminary risk assessments.

Gas Risk

Whilst there are no buildings or basements associated with the Project, an assessment of the risks from ground gas associated with made ground, superficial deposits, bedrock geology and mining legacy need to be considered in relation to construction and maintenance workers. The Study Area largely occupies geology of the Scottish Coal Measures Group and falls within a CMRA and partially in DHRA's, with associated mining activities. Mine gas issues will be considered for all Project components within the defined Coal Mining Reporting Areas.

If deeper foundation solutions are proposed these could present preferential pathways or reservoirs for hazardous gasses associated with both the geology and mining, an assessment of the potential receptors and risk associated would need to be reviewed in detail.

¹³⁸ Ordnance Survey Maps, (n.d.) National Library of Scotland <https://maps.nls.uk/os/>

According to UKRadon Interactive map viewer¹³⁹ the risk from radon is considered low, with the maximum radon potential recorded as 1-3% in an isolated area south of Denny North Substation, along a portion of ZG route. However, SPEN has advised that an area of radon has been identified on land to the east of Wishaw substation, a by-product of a former clock factory. Further information in relation to this will be reviewed when available.

Designated Sites for Geological Protection

A review of NatureScot's Sitelink¹⁴⁰ maps indicates that there are no designated sites for geological protection within or within the vicinity of the Study Area. Figure 9.5 (Appendix A) highlights the closest SSSI and Geological Conservation areas.

The proposed new-build overhead line intersects Greystone Knowe, a Wildlife Site designated by Falkirk Council. Greystone Knowe is recognised for its locally rare wet heath and mire vegetation associated with good species diversity¹⁴¹. Excavation of peat and carbon-rich soils within this Wildlife Site could impact habitats important to this local designation.

The Slamannan Plateau is situated 160m to the south-east of the proposed new-build overhead line. This SSSI incorporates Wetland habitats present on the plateau including bogs at Fannyside Muir and Darnrig Moss. Fannyside Muir is an area of peatland, including blanket, raised and intermediate bog types. Bog habitats are key sites within the SSSI boundary for bean geese. No component of The Project directly intersects the Slamannan Plateau.

9.4 Likely Significant Effects

The following impacts have potential to give rise to significant effects:

- Contamination, degradation or erosion of soil;
- Contamination of nearby surface water from construction works, temporary works, spills or plant breakdown;
- Disturbance of potentially contaminated soils (identified in land contamination) and creation of new pathways allowing migration of such contaminants to reach sensitive receptors (including construction workers, site users and the water environment) during construction;
- Excavation, temporary storage, backfilling and compaction of soils during tower installation, substation works, including the creation of temporary access tracks and hardstanding areas;
- Disturbance and damage to peatland habitats relating to all works and construction of temporary access tracks and hardstanding areas;
- If deeper foundation solutions are proposed these could present preferential pathways or reservoirs for hazardous gasses associated with both the geology and mining, an assessment of the potential receptors and risk associated would need to be reviewed in detail;

¹³⁹ UK Radon Interactive map viewer, (2025) UKRadon <https://www.ukradon.org/information/ukmaps%20>

¹⁴⁰ Map Search, (n.d.) NatureScot <https://sitelink.nature.scot/map>

¹⁴¹ Appendix 1 Site Statements: Wildlife Sites, (no date) Falkirk Council
<https://coins.falkirk.gov.uk/viewSelectedDocument.asp?c=e%97%9Db%93m%7D%8F>

- Effect on climate due to loss of carbon (discussed further in the Climate Chapter (Chapter 16)); and
- Surface subsidence and damage to sections where new build lines are proposed resulting from the presence of historic coal mine workings.

9.5 Proposed Surveys and Assessment Methodology

Further desk-based research is planned to provide a better understanding of baseline conditions of the Scoping Boundary and includes purchasing information from third-party sources (e.g. Groundsure Report or similar).

Individual Phase 1 Geotechnical and Geoenvironmental Reports (hereafter referred to as 'Phase 1 reports') will be prepared for the following project components:

1. Overhead Lines – Construction of a new 20km 400kV overhead line between Bonnybridge Substation and an existing overhead line (XX route) north of Glenmavis, the removal of approximately 11km of an existing 132kV overhead line between Bonnybridge and Cumbernauld (CB route), undergrounding of two sections of the existing 132kV overhead line between Bonnybridge and Bathgate (AA route) where it is crossed by the proposed new-build OHL;
2. Denny North Substation;
3. Bonnybridge Substation;
4. Cumbernauld Substation; and
5. Wishaw Substation

Each Phase 1 Report will be undertaken in line with the UK government guidance presented in Land Contamination: Risk Management^{Error! Bookmark not defined.}. This will comprise a desk-based review of the following:

- A site walkover;
- A review of the site's geological, hydrological and hydrogeological setting, and public domain geo-environmental information to build up an understanding of the site and surrounding environmental setting / sensitivity;
- Review of current and historical Ordnance Survey maps and regulatory data presented within a Groundsure (or similar) report, with an emphasis on identifying potential on-site and off-site contamination sources;
- Review of mining data presented within a Consultants Mining Report, including mine gas risk;
- Review of available geological borehole data held by the BGS;
- Review of historical reports and / or information relating to the Project (including any exploratory drilling), should they be available;

- Review of information held by the Local Authority, Petroleum Officer (if necessary) and SEPA via consultation, consultation of publicly available information (including radon maps, Mining Remediation Authority maps etc) and procurement of an Unexploded Ordnance Pre-Desk Study Assessment; and
- Review of information held by NatureScot and Historic Environment Scotland.

The Phase 1 Reports will be used to undertake Preliminary Risk Assessments (PRA) and develop Initial Conceptual Site Models (CSM).

It is proposed that no standalone EIAR Geology, Soils and Mining chapter will be provided for Denny North, Bonnybridge, Cumbernauld and Wishaw substations. The key impacts arising from these project components would be covered under the Phase 1 Reports, which will accompany each Local Planning application. This Scoping request assumes that the Applicant would implement all recommendations specified by the Phase 1 reports. Therefore, it is considered there would be no likely significant effects resulting from contaminated land, or historic mining hazards for these project components. It is assumed that for these project components, any contamination or mining hazards can be adequately addressed through the detailed geotechnical design, and implementation of an appropriate remediation strategy (if applicable).

Considering the limited ground works (and therefore limited/no contact with soils) associated with the proposed developments at Easterhouse Substation and at the uprated OHL project components, further reporting is not considered to be required for these elements. No EIAR Ground Conditions chapter, or Phase 1 Report will be provided for these project components.

Based on the assessment of the baseline and the identification of any potential impacts, the Phase 1 Reports will make recommendations for mitigation measures. These may include the recommendation for an initial intrusive investigation, quantitative risk assessment, remediation and validation. The Phase 1 Reports will also make recommendations for possible mitigation measures to be employed by contractors, should any previously unidentified contamination be encountered during the construction phase.

Peat depth surveys associated with the new-build overhead line (Where potential Class 1 carbon-rich soils are present) will be undertaken to allow estimations of peat depth and extent, and facilitate avoidance of the deepest areas of peat.

The potential effects on geology and soils will be assessed based on the methodology presented within DMRB LA109 Geology and Soils.

Mitigation Measures

As per the Hierarchy of Control outlined in Construction (Design and Management) Regulations 2015¹⁴², duty holders must follow a hierarchy of control measures, starting with eliminating hazards where possible and then progressing to the use of engineering controls, administrative controls, and personal protective equipment.

Mitigation for the Project will generally follow the hierarchy of mitigation, with the avoidance of significant adverse effects undertaken where possible as the first course of action. Where

¹⁴² The Construction (Design and Management) Regulations 2015 (2025) UK Government
<https://www.legislation.gov.uk/uksi/2015/51/introduction/made>

significant adverse effects cannot be avoided, further measures will be implemented. Indicative mitigation measures have been identified below.

The risk assessment process to identify, assess and evaluate the health and environmental risks that may be associated with identified contamination hazards should follow the methodology set out in the Environment Agency's Land Contamination: Risk Management (LCRM) guidance¹⁴³. Any significant risks identified within the Desk Studies would require further investigation including quantitative risk assessment to inform requirements for remedial action if required and/or implementation of appropriate controls during construction.

Protection measures will be required for soils to avoid compaction. Measures should also be in place to alleviate any compaction should it occur.

For the New-build Overhead Line, careful design will be required to avoid areas of deep peat. The New-build Overhead Line and substations require to be founded in suitable strata and so the presence of deep peat may mean conventional methods cannot be used. The EIAR for the overhead line project components will include further baseline peat survey information, and an assessment of impacts on peat, including required mitigation.

Careful design to avoid areas where historic coal mine workings are present will be required. This is particularly relevant where mine entries are recorded. Where these cannot be avoided further investigation is required to determine if these have been treated and / or determine whether exclusion zones will be required. The design of temporary access tracks and hardstanding areas will also need to avoid areas where mine entries are recorded. Where towers on the new line are proposed over former mine workings, targeted ground investigation will ensure foundations proposed at these locations are sufficient for the ground conditions, and to determine the requirement for remedial treatment. Consideration of the effect on shallow underground coal mine workings should also be given, recognising that these may collapse potentially causing surface subsidence and damage to the Project.

9.6 Summary of Proposed Scope

This chapter has identified the existing baseline, and likely impacts associated with the Project on geology and soils.

It is proposed that no standalone EIAR Ground Conditions chapter will be provided for Denny North, Bonnybridge, Cumbernauld and Wishaw substations. The key impacts arising from these project components would be addressed by the recommendations made within the Phase 1 Geotechnical and Geoenvironmental Reports, which will accompany each Local Planning application.

It is not considered that an EIAR is required for the uprated sections of the overhead lines, or at Easterhouse Substation as there will be no or limited disturbance to nor contact with soils in these locations.

An EIAR Ground Conditions chapter will be provided only in relation to the New-build overhead line aspects of The Project. This EIAR chapter will consider impacts on peatland and carbon-rich soils during construction of this project component. A separate Phase 1 Geotechnical and

¹⁴³ Land Contamination Risk Management (LCRM) (2023) Environment Agency
<https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm> Last Accessed February 2025

Geoenvironmental Report will also be produced for the New-build overhead line and issued as part of the Section 37 application.

Table 9-1 below provides a summary of the project components where the Geology and Soils topic is scoped into the EIARs covering the various project components.

Table 9-1 Summary of Proposed Scope - Inclusion of Geology and Soils Topics within EIARs

Project Component	Phase	Geology and Soils Topic Scoped in / out?	Rationale (only where Topic is scoped out)
New-build overhead line *	Construction	In	
	Operation	Out	No or limited contact with or disturbance of soils will be required during the operational phase.
Upgraded overhead line (ZG Route)	Construction	Out	No or limited contact with or disturbance of soils will be required during the upgrading works.
	Operation	Out	No or limited contact with or disturbance of soils will be required during the operational phase.
Upgraded overhead line (XX Route)	Construction	Out	No or limited contact with or disturbance of soils will be required during the upgrading works.
	Operation	Out	No or limited contact with or disturbance of soils will be required during the operational phase.
Upgraded overhead line (XR Route)	Construction	Out	No or limited contact with or disturbance of soils will be required during the upgrading works.
	Operation	Out	No or limited contact with or disturbance of soils will be required during the operational phase.

Project Component	Phase	Geology and Soils Topic Scoped in / out?	Rationale (only where Topic is scoped out)
CB Route Removal and AA Route Ungrounding *	Construction	Out	CB route removal requires contact with soils with regards to removal of existing foundations to a maximum depth of 1mbgl. Undergrounding of AA route requires excavations. A Phase 1 Geotechnical and Geoenvironmental Report will be undertaken separately, and all report recommendations will be implemented.
	Operation	Out	No or limited contact with or disturbance of soils will be required during the operational phase.
Denny North Substation *	Construction	Out	Impacts are limited to mining hazard, and contact or disturbance of potentially contaminated soils. A Phase 1 Geotechnical and Geoenvironmental Report will be undertaken separately, and all report recommendations will be implemented.
	Operation	Out	No contact with or disturbance of soils will be required during the operational phase.
Bonnybridge Substation *	Construction	Out	Impacts are limited to mining hazard, and contact or disturbance of potentially contaminated soils. A Phase 1 Geotechnical and Geoenvironmental Report will be undertaken separately, and all report recommendations will be implemented.
	Operation	Out	No contact with or disturbance of soils will be required during the operational phase.
	Construction	Out	Impacts are limited to mining hazard, and contact or disturbance of potentially contaminated soils. A Phase 1 Geotechnical and

Project Component	Phase	Geology and Soils Topic Scoped in / out?	Rationale (only where Topic is scoped out)
Cumbernauld Substation *			Geoenvironmental Report will be undertaken separately, and all report recommendations will be implemented.
	Operation	Out	No contact with or disturbance of soils will be required during the operational phase.
Easterhouse Substation	Construction	Out	No contact with or disturbance of soils will be required during the Easterhouse Substation works.
	Operation	Out	No contact with or disturbance of soils will be required during the operational phase.
Wishaw Substation *	Construction	Out	Impacts are limited to mining hazard, and contact or disturbance of potentially contaminated soils. A Phase 1 Geotechnical and Geoenvironmental Report will be undertaken separately, and all report recommendations will be implemented.
	Operation	Out	No contact with or disturbance of soils will be required during the operational phase.

*Indicates where a Phase 1 Geotechnical and Geoenvironmental Report will be produced

10.

Traffic and Transport

10. Traffic and Movement

10.1 Introduction

The Traffic and Movement EIAR chapters will assess the environmental effects of vehicles generated by the Project. The assessment will be prepared in accordance with the Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement, July 2023¹⁴⁴.

The construction of the Project will be included in the environmental assessment of traffic and movement. Construction traffic generated by the Project is expected to be sufficient to meet criteria in the IEMA Guidelines for environmental assessment of traffic and movement.

The operation of the Project is expected to generate only occasional maintenance and service traffic. Operational traffic generated by the Project is not expected to meet criteria in the IEMA Guidelines for the environmental assessment of traffic and movement. It is proposed the operation of the Project is scoped out of the environmental assessment of traffic and movement.

10.2 Relevant Legislation, Policy and Guidance

The IEMA Guidelines are the relevant topic specific guidance and provide a robust methodology for the environmental assessment of traffic and movement. The IEMA Guidelines were published in July 2023. They are fully endorsed by The Chartered Institution of Highways and Transportation (CIHT) and supported by The Institute of Air Quality Management (IAQM).

Relevant legislation, policy and guidance relating to transport and the Project will be reviewed and used to inform the traffic and movement assessment. They include:

- NPF4¹⁴⁵ – Sets out the Scottish Government’s policy on nationally important land use and infrastructure requirements. Energy policy requirements include addressing impacts on road traffic and trunk roads, including during the construction stages of energy related development;
- National Transport Strategy 2¹⁴⁶ – Sets out a vision for the national transport system for the next 20 years, which protects the climate and improves lives;
- North Lanarkshire Council LDP¹⁴⁷ and Local Transport Plan;
- Falkirk Council LDP2 and Local Transport Strategy 2023 – 2033¹⁴⁸;

¹⁴⁴ Environment Assessment of Traffic and Movement (2023), IEMA <https://www.iema.net/media/5mrmquib/iema-report-environmental-assessment-of-traffic-and-movement-rev07-july-2023.pdf>

¹⁴⁵ National Planning Framework 4 (2023), Scottish Government <https://www.gov.scot/publications/national-planning-framework-4/documents/>

¹⁴⁶ National Transport Strategy 2 (2020), Transport Scotland <https://www.transport.gov.scot/publication/national-transport-strategy-2/>

¹⁴⁷ North Lanarkshire Local Development Plan (2022), North Lanarkshire Council <https://www.northlanarkshire.gov.uk/sites/default/files/2022-11/North%20Lanarkshire%20Local%20Development%20Plan.pdf>

¹⁴⁸ Local Transport Strategy (2023), Falkirk Council <https://www.falkirk.gov.uk/roads-parking-transport-policies-and-strategies/local-transport-strategy-2023>

- Planning Advice Note PAN75: Planning for Transport and Planning: Transport Assessment and Implementation: A Guide provides good practice guidance¹⁴⁹;
- Designing Streets¹⁵⁰ – Sets out policy and guidance on the design of urban streets; and
- Design Manual for Roads and Bridges (DMRB)¹⁵¹ – Sets out design standards for trunk roads but these are also applicable in certain cases to non-trunk roads.

10.3 Traffic and Movement Study Area

The geographical extents of the traffic and movement Study Area will be informed by IEMA Guidelines. Criteria within the guidelines will be used to establish an appropriate study area. The Study Area will be based on public roads that provide sub-regional and local access to the Project, and on which the impact of Project traffic may need to be considered in order to demonstrate environmental effects.

10.4 Identification of Potential Effects

In accordance with IEMA Guidelines the assessment of environmental effects will include:

- Severance of communities – This is the perceived division that can occur within a community when it becomes separated by a major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.
- Fear and intimidation on and by road users – This is the proximity of traffic to people and / or the feeling of an inherent lack of protection created by factors that prevent people from distancing themselves from moving vehicles. It assesses the perceived vulnerability of road users in terms of changes in traffic flows and or speeds, the amount of heavy goods vehicle (HGV) traffic on a road, and the speed that vehicles are travelling at.
- Road user and pedestrian safety – This is the potential for increases or changes in traffic flows on a road to increase the number of injury accidents on that road. This aspect of the environmental assessment considers the entire construction period and is not limited to a peak month or corresponding daily traffic forecast.
- Non-motorised user amenity – This is broadly defined as the relative pleasantness of a pedestrian, cycle, wheeled or equestrian journey along or beside a road. The potential for effects relates to changes in traffic flows and or speeds, the amount of HGV traffic on a road, and the speed that vehicles are travelling at.
- Non-motorised user delay – This effect is closely related to severance. Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. In

¹⁴⁹ Planning Advice Note: PAN 75 – Planning for Transport (2005), Scottish Government
<https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2005/08/planning-advice-note-pan-75-planning-transport/documents/0016795-pdf/0016795-pdf/govscot%3Adocument/0016795.pdf>

¹⁵⁰ Designing Streets: A Policy Statement for Scotland (2010), Scottish Government
<https://www.gov.scot/binaries/content/documents/govscot/publications/corporate-report/2010/03/designing-streets-policy-statement-scotland/documents/0096540-pdf/0096540-pdf/govscot%3Adocument/0096540.pdf>

¹⁵¹ Design Manual for Roads and Bridges (2020), National Highways <https://nationalhighways.co.uk/suppliers/design-standards-and-specifications/design-manual-for-roads-and-bridges-dmrbr/>

general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity on Study Area roads.

- Road vehicle driver and passenger delay – This effect relates to delays or increases in travel time for non-development vehicular traffic. Increases in traffic along roads, at junctions, or at development site entrances can adversely affect overall journey times and delays. IEMA Guidelines acknowledge that delays are only likely to be significant when the traffic on the network surrounding a development is already at, or close to, the capacity of the system.
- Hazardous loads / large loads – The effect relates to developments that involve the transportation of dangerous or hazardous loads, and or the transport of Abnormal Indivisible Loads (AIL) to or from a development site. The assessment must clearly outline the number and composition of such loads. Where the number is considered to be significant an appropriate routing and risk strategy must be identified.

The above potential environmental effects will be assessed for all OHL works and all substation works.

10.5 Assessment Methods

Roads Authorities

Relevant road authorities will be consulted. Bespoke traffic and movement scoping papers will be prepared to agree the detailed method of assessment. This will include traffic data to be collected, other data sources to be used, and details regarding the proposed method of assessment. Relevant roads authorities will include; Transport Scotland, Falkirk Council and North Lanarkshire Council.

Baseline Traffic Data

Comprehensive traffic data on Study Area roads will be collected to inform the environmental assessments. This will provide vehicle flows by time of day and vehicle type, and vehicle speeds by time of day for all Study Area roads expected to carry construction traffic. Appendix A, Figure 10.1 shows an indicative Traffic Study Area for the Project with locations where traffic data will be required.

Injury accident data for Study Area roads is also required for environmental assessment. The most recently available injury accident information for Study Area roads will be obtained from relevant Police Scotland records.

Site visits to the Project locations will be undertaken in order that Study Area transport networks and baseline traffic conditions are understood in the context of the construction traffic expected to be using Study Area roads.

OHL and Substation Construction Traffic

Project construction traffic will be forecast from respective construction programmes. Separate vehicle forecasts will be prepared for the five substations and the OHL components. The construction vehicle forecasts will be classified into Car, light goods vehicle (LGV), HGV or AIL traffic.

Peak months of vehicle activity within the respective substation and OHL construction programmes will be identified. For peak months an average daily construction vehicle forecast will be calculated, typically on the basis of 22 working days per month.

Daily construction vehicle traffic will be assigned to Study Area roads. This assignment will consider the likely origins of construction traffic, and destinations within the Study Area. The distribution of substation construction traffic to Study Area roads will be relatively straightforward, as it has a singular destination and benefits from an existing access to the substation.

The distribution of OHL construction traffic to Study Area roads will be more complex. Destinations for construction traffic will encompass the length of the OHL routes, which cover a wide Study Area in terms of public roads and access locations. It is proposed that construction traffic distributions are prepared for each OHL individually, and then aggregated according to construction programme to forecast robust daily flows on Study Area roads (to satisfy Rochdale Envelope principles¹⁵²).

Extents of Assessment

The IEMA Guidelines include two broad rules that define the scale and extent of the environmental assessment for traffic and movement. Rule 1 and Rule 2 are used to define the spatial extents of this environmental assessment.

- Rule 1 – Include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and
- Rule 2 – Include highway links of high sensitivity where traffic flows have increased by more than 10%.

The IEMA Guidelines are based upon knowledge and experience of environmental effects of traffic and movement. They acknowledge that traffic forecasting is not an exact science. The Rule 1 30% threshold is based on research and experience of the environmental effects of traffic, with less than a 30% increase generally resulting in imperceptible changes in the environmental effects of traffic apart from within specifically sensitive areas. The IEMA Guidance considers that forecast changes in traffic of less than 10% in specifically sensitive areas creates no discernible environmental effect, hence the traffic increase threshold set out in Rule 2.

For Study Area roads included in the assessment under Rule 1 and Rule 2 their environmental characteristics will be qualified and quantified. Study Area roads will be qualified according to their sensitivity as a receptor, including the traffic, people, infrastructure and land-uses currently associated with the road. Study Area roads are quantified according to their baseline traffic characteristics including vehicle flows, accident rates, and levels of congestion. Project traffic assigned to Study Area roads will be assessed against forecast year baseline traffic conditions to produce a magnitude of change to be used in the environmental assessment.

¹⁵² Nationally Significant Infrastructure Projects – Advice Note Nine: Rochdale Envelope (2018), Gov.UK
<https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope#the-rochdale-envelope-background>

Sensitivity of Receptors

Receptors are locations or land-uses along Study Area roads categorised by sensitivity or environmental value. All Study Area roads are assessed in terms of their sensitivity as environmental receptors.

Construction traffic will only be temporary, however any increase in traffic could have an environmental effect on the public roads within the Study Area, the people who use the roads, and the land uses along the roads. Receptors to be included in the environmental assessment are public roads that will be used by Project construction traffic.

In accordance with IEMA Guidelines the following list is used to identify land use and environmental interests on Study Area roads that should be considered when assessing the sensitivity of Study Area roads as receptors.

- People at home;
- People at work;
- Sensitive and / or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors);
- Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools);
- Retail areas;
- Recreational areas;
- Tourist attractions;
- Collision clusters and routes with road safety concerns; and
- Junctions and highway links at (or over) capacity.

For every Study Area road, each of the above land uses and environmental interests will be assessed on a scale of 1 to 5. Sensitivity of receptor 1 to 5 ratings will be assigned as follows.

- Negligible Sensitivity = 1;
- Low Sensitivity = 2;
- Medium Sensitivity = 3;
- High Sensitivity = 4; and
- Very High Sensitivity = 5.

For each Study Area road, an average sensitivity of receptor rating will be calculated from the individual land use and environmental interest scores. However, any Study Area road which has one or more rating of High Sensitivity (4) or Very High Sensitivity (5) will default to that rating.

Magnitude of Change

Magnitude of change for the severance of communities will be considered as follows. The Department for Transport (DfT) has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as

producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively. Although these thresholds no longer appear in DfT guidance, they have not been superseded by any subsequent guidance and are established through planning case law.

Table 10-1 shows the thresholds to be adopted for this environmental assessment.

Table 10-1 Severance of Communities Magnitude of Change

Magnitude of Change	Change in Traffic (Average Weekday)	Description
High	<90%	Alteration to baseline conditions such that with development character or composition of baseline condition fundamentally changed.
Medium	60-90%	Alteration to baseline conditions such that with development character or composition of baseline condition materially changed.
Low	30-60%	Minor shift from baseline conditions such that post development character or composition of baseline condition remains similar to baseline and not materially changed.
Negligible	<30%	Very little change from baseline conditions. Change is barely distinguishable approximating to no-change situation.

Magnitude of change for fear and intimidation on and by road users will be considered as follows. IEMA Guidelines provide a fear and intimidation degree of hazard methodology that establishes a ‘level’ of fear and intimidation, which subsequently allows a fear and intimidation magnitude of change to be determined.

Degree of hazard is established by scoring traffic on Study Area roads for Baseline and Project traffic conditions. Table 10-2 shows the degree of hazard scoring system to be applied to all Study Area roads.

Table 10-2 Fear and Intimidation Degree of Hazard

18hr Traffic Flow Average Two-Way Traffic Vehicles / Hour (a)	18hr Traffic Flow Total HGV Movements (b)	Average Vehicle Speed MPH (c)	Degree of Hazard Score
+1,800	+3,000	>40	30
1,200 – 1,800	2,000 – 3,000	30 - 40	20
600 – 1,200	1,000 – 2,000	20 - 30	10
<600	<1,000	<20	0

For each Study Area road, the total degree of hazard score (a) + (b) + (c) for Baseline and Project traffic conditions will be summed to provide a 'level' of fear and intimidation in accordance with Table 10-3.

Table 10-3 Levels of Fear and Intimidation

Fear and Intimidation Level	Total Hazard Score (a) + (b) + (c)
Extreme	71+
Great	41 - 70
Moderate	21 - 40
Small	0 - 20

Magnitude of change will be established from changes in fear and intimidation levels between Baseline and Project traffic flows in accordance with Table 10-4.

Table 10-4 Fear and Intimidation Magnitude of Change

Magnitude of Impact	Change in Level / Change in Daily Traffic
High	2 Level Changes
Medium	1 Level Change plus >400 increase in average hourly vehicle flow and / or

Magnitude of Impact	Change in Level / Change in Daily Traffic
	>500 increase in total 18hr HGV flow
Low	1 Level Change plus <400 increase in average hourly vehicle flow and / or <500 increase in total 18hr HGV flow
Negligible	No Level Change

Magnitude of change for road user and pedestrian safety will be considered as follows. IEMA Guidelines consider the calculation of accident rates a relevant approach for approximating the potential for road safety impacts to materialise as a result of the Project. Knowing the expected increase in vehicle kilometres driven on Study Area roads as a result of Project traffic, it is possible to make a simple arithmetic assessment of the likely increase or decrease in the number of accidents resulting from changes in traffic flows or composition.

Accidents by severity for the most recent period for which records are held will be combined with traffic flows to produce accident rates by severity per million vehicle kilometres for all Study Area roads. A forecast of vehicle kilometres driven on Study Area roads by Project traffic for the duration of the construction programme is calculated. The accident rates per million vehicle kilometres will be applied to Project traffic to produce a forecast of accidents by severity for the duration of the construction stage. Magnitude of change for road user and pedestrian safety will be assessed according to Table 10-5.

Table 10-5 Road Safety Magnitude of Change

Magnitude of Change	Forecast Increase in Accidents by Severity		
	Slight Accidents	Serious Accidents	Fatal Accidents
High	=>5	=>1	=>1
Medium	3 - 4	0	0
Low	1 - 2	0	0
Negligible	0	0	0

Magnitude of change for non-motorised user amenity and non-motorised user delay will be considered as follows. These effects are closely related to severance in terms of changes in the volume, composition or speed of traffic may affect the relative pleasantness (amenity) or progress (delay) made by non-motorised users. In general, increases in traffic levels are likely

to lead to reductions in amenity and increases in delay for non-motorised users. Absolute levels of change to non-motorised amenity and delay will depend on the general level of pedestrian and active travel activity on Study Area roads. The magnitude of change thresholds set out in Table 10-1 for severance are adopted for non-motorised environmental effects.

Magnitude of change for road vehicle driver and passenger delay will be considered as follows. Where junction capacity testing has been undertaken on Study Area roads changes to the Level of Service (LoS) provided by each arm of the junction tested will be used to estimate magnitude of change. Table 10-6 summarises the magnitude of change thresholds to be adopted in this assessment for road vehicle driver and passenger delay.

Where Study Area roads are assessed by link flow, the Congestion Reference Flow (CRF) of the Study Area road will be used. The CRF of a Study Area road is an estimate of the daily traffic flow at which the road is likely to be 'congested' in peak periods on an average day. For the purposes of calculating CRF 'congestion' is defined as the situation when traffic demand exceeds the maximum sustainable throughput of the road. At this point the effect on traffic is likely to be one or more of the following: flow breaks down with speeds varying considerably, average speeds drop significantly, the sustainable throughput of the road is reduced, and queues are likely to form. Table 10-6 summarises the magnitude of change thresholds to be adopted in this assessment for road vehicle driver and passenger delay.

Table 10-6 Driver Delay Magnitude of Change

Magnitude of Change	Junction Capacity Testing LoS on Junction Arms	Study Area Road Congestion Reference Flow
High	A, B or C to D+	>90% CRF
Medium	A or B to C	60% <>90% CRF
Low	A to B	30%<>60% CRF
Negligible	No Change in LoS	<30% CRF

Magnitude of change for hazardous / large loads will be considered as follows. Of the categories included in the IEMA Guidelines it is proposed hazardous loads are scoped out. It is considered unlikely there will be significant construction traffic generated whose loads would fall within current classifications for carriage of dangerous goods (Class 1-9). Fuel will require to be transported to sites for construction plant and equipment. This is a Class 3 Flammable Liquid. This will be transported to site via fuel tanker which are commonplace on UK roads.

Any AIL will travel to the Project sites by road. For scoping purposes AIL are expected to travel from a port(s) (to be identified) to site accesses via Study Area roads. A Preliminary Route

Appraisal for the transport of any AIL from ports to site(s) will be prepared including proposed routes, AIL vehicle types and axle loads, and vehicle swept-paths for any obvious constraints.

Cumulative Assessment

Depending on specific construction programmes for the 5 substations and the OHL there may be a requirement for significant Intra-Cumulative as well as Inter-Cumulative environmental assessments. Intra-cumulative assessment would consider the effects of the substation(s) and OHL construction. Inter-cumulative assessment would consider the effects of the substation(s) and OHL in combination with any other third-party developments agreed to be included for cumulative purposes.

For cumulative assessments the IEMA Guidelines combination of sensitivity of receptor and magnitude of change will be used to identify the significance of effects on Study Area roads. For any significant adverse effects on Study Area road links, appropriate mitigation will be proposed, and a residual significance of effect post mitigation will be identified and summarised. For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed up by data or quantified information where possible.

10.6 Summary of Proposed Scope

EIAR transport chapters will be produced in accordance with IEMA Guidelines for all OHL works and substation works where required. A single EIAR transport chapter will be produced for the OHL works. All EIAR chapters will be informed by robust baseline traffic information obtained by traffic survey.

The significance of environmental effects on traffic and movement potentially resulting from substation and OHL construction traffic will be identified. A combination of the sensitivity of receptor and the magnitude of change will be used to identify the significance of environmental effects on Study Area roads. For any significant adverse effects on Study Area roads appropriate mitigation will be proposed, and a residual significance of effects post-mitigation identified.

Traffic and movement technical appendices will be provided to support all EIAR chapters. These technical appendices will include all data and calculations relied upon by the EIAR chapters.

Table 10-7 provides a summary of the Project Components where the Traffic and Movement topic is scoped into the EIARs.

Table 10-7 Summary of Proposed Scope – inclusion of Traffic and Movement Topic within EIARs

Project Component	Phase	Traffic and Movement Topic Scoped in / out?	Rationale (only where Topic is scoped out)
New-build overhead line	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
Upgraded overhead line (ZG Route)	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
Upgraded overhead line (XX Route)	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
Upgraded overhead line (XR Route)	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.

Project Component	Phase	Traffic and Movement Topic Scoped in / out?	Rationale (only where Topic is scoped out)
CB Route Removal and AA Route Ungrounding	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
Denny North Substation	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
Bonnybridge Substation	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
Cumbernauld Substation	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
Easterhouse Substation	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.

Project Component	Phase	Traffic and Movement Topic Scoped in / out?	Rationale (only where Topic is scoped out)
Wishaw Substation	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.
	Construction	Scoped in	
	Operation	Scoped out	Operational traffic is not expected to meet the criteria where environmental assessment of traffic and movement is required.

11.

Noise and Vibration

11. Noise and Vibration

11.1 Introduction

This chapter provides a brief overview of the noise and vibration baseline conditions, the potential effects associated with the construction and operation of the Proposed Development and the proposed scope of assessment methodology to be considered in the Environmental Impact Assessment (EIA) Report. The Proposed Development consists of a new 400kV Overhead Line (OHL) between Bonnybridge substation and Glenmavis, the uprating of three OHLs from 275kV to 400kV (ZG Route: Bonnybridge to Denny North, XX Route: Easterhouse to Newarthill and XR Route Newarthill to Wishaw), and extensions to five substations (Denny North, Bonnybridge, Cumbernauld, Easterhouse, Wishaw).

11.2 Baseline Conditions

Summary of Baseline

The Proposed Development is located within a predominantly urban and suburban area. The exact OHL alignments are not known at time of writing, but the main areas within the rough vicinity of the Proposed Route include (from north to south) Denny North, Bonnybridge, Cumbernauld, Glenmavis, Coatbridge, Airdrie, Chapelhall, and Wishaw. Smaller settlements, individual dwellings, and clusters of properties are also distributed along the length of the Proposed Route.

Sensitive Receptors

Noise sensitive receptors (NSRs) are defined in the context of this assessment as receptors which are potentially sensitive to noise and vibration located. NSRs are usually taken as properties within 500 m of a nominal centreline of a Proposed OHL Route or 1.5 km of a nominal centre of a Proposed Substation. Beyond these distances receptors are unlikely to be impacted by the noise from of the Proposed Development due to the typical sound levels of sources.

Following confirmation of details of the Proposed Development, such as alignments, conductor and tower types, and substation equipment, calculations will be conducted to determine a distance from the Proposed Development beyond which noise impacts are not likely at NSRs. The noise assessment conducted for these properties will be based on the predicted highest (worst case) noise impact from the Proposed Development, and therefore if the chosen properties meet noise criteria, then any property at greater distances will also pass the criteria.

AddressBase data and satellite imagery will be used to identify the potential NSRs. Receptors chosen will be representative of the closest addresses surrounding the Proposed Development, and measurement locations agreed with the Local Authority prior to measurement. Where the Proposed Development is located in proximity to properties in groups or close to settlements, one location may be chosen as being representative of several properties that would produce duplicate readings.

Baseline Noise Surveys

A survey of the background ($L_{A90,T}$) ambient noise ($L_{Aeq,T}$), and 1/3rd octave band spectrum levels will be conducted to determine the existing noise level in the area and at any nearby noise sensitive receptors (NSRs) likely to be affected by the noise of the Proposed Development.

Survey locations in proximity of Proposed OHL Developments will be determined by the outcome of a TGN(E)322 assessment. To ensure that values are reliable and representative of the outdoor amenity of NSRs, attended spot measurements will be conducted in suitably dry conditions and very low wind in accordance with BS 4142.

Survey locations in proximity to Proposed Substation Developments will be selected as receptors most likely to be affected by the noise in accordance with BS 4142. To ensure that values are reliable and representative of the outdoor amenity of NSRs, a minimum of 1-week continuous background monitoring must be conducted.

11.3 Potentially Significant Effects

At this scoping stage, the potential significant effects associated with construction and operation of the Proposed Development are described in the following subsections.

Construction Noise and Vibration

There is the potential for construction noise and vibration impacts from static, quasi static and mobile plant items carrying out construction activities including:

- Installation of, and stringing of, electricity towers, potentially including tree felling and the use of cranes;
- Installation of electrical equipment such transformers, circuit breakers, bus bars, and building of any buildings, foundations or enclosures;
- Plant movements creating traffic noise on access tracks; and
- Any potential vibration effects that would be from construction of the foundations and associated plant and machinery. If rock breaking is required, the potential for vibration effects will be increased. Similarly, the potential for effects increases for peat removal and / or rotary piling during the construction of foundations.

Operational Noise

Overhead Lines

OHL noise is generally associated with a phenomenon known as corona discharge. This is essentially a limited electrical breakdown of the air which, in the main, occurs during damp weather. Corona discharge will create a source of audible noise (a crackling sound occasionally accompanied by a low frequency hum in certain wet conditions). Power transmission line conductors are designed to minimise corona discharge, but this may be affected by minor surface irregularities caused by damage, insects, raindrops, or pollution. The highest noise levels generated by an OHL usually occur during light rain when water droplets, collecting on the surface of the conductor, can initiate corona discharge. The number of droplets that collect, and hence the amount of noise, depends on the rate of rainfall.

Aeolian noise is caused by wind blowing through the conductors and / or structures. This type of noise is usually infrequent and depends on wind velocity and direction. Aeolian noise is caused by wind blowing over a structure resulting in vibration that matches the natural frequency of the structure, or vortex shedding on the surface of a structure. There is currently not a standardised method to predict this type of noise, therefore it is difficult to assess. Dampers can be attached to the lines to minimise aeolian noise.

Substation

Transformers and other electrical equipment associated with substation developments emit noise at frequencies of twice the normal operating current frequency due to magnetostriction of the transformer core. In the UK the supply current frequency is 50 Hertz (Hz), which results in 100 Hz and harmonics thereof being produced by the transformer. The nature of the noise generation mechanism results in tonal noise being emitted. The noise is continuous and consistent depending on the electrical load of the equipment, and therefore is not expected to have any impulsive characteristics.

11.4 Mitigation

As part of the impact assessment process, mitigation measures may be identified to reduce the level of predicted noise impacts, particularly where this is necessary to avoid significant adverse effects. Two types of measure can be distinguished, as follows:

- Mitigation measures, aimed at managing potential impacts of moderate or major significance to reduce residual effects to an acceptable level; and
- Measures including adoption of good practice aimed at managing potential effects of minor significance.

Mitigation During Design

Overhead Line

Noise impacts vary by conductor and proximity to the alignment. Potential adverse impacts can be avoided by appropriate selection of conductor type and the alignment of the OHL.

There is no method for the prediction or assessment of potential aeolian noise impacts. Therefore, aeolian noise should be anticipated and mitigated in the design of the Proposed Development. A proactive approach to mitigation must be taken. To avoid potential issues with aeolian noise, the OHL tower structure should avoid using components which have been previously known to emit aeolian noise. Where possible, a statement from manufacturers should be sought that components used do not produce significant aeolian noise. Components that are likely to cause this noise include, but not limited to; insulators, dampers, conductors.

Substation

A detailed noise impact assessment is required to determine the extent of mitigation required for the site to reduce the impact on NSRs. If a noise impact assessment finds that mitigation is required, it will likely be around the externally housed equipment of the Proposed Development to curtail the noise impact on the critical receptors. The most effective mitigation is to procure low noise equipment at source. If noise impacts remain additional mitigation may be required, this may come in the form of barriers within the site, bunds around the site, or building at lower platform heights, effectively “sinking” the site to reduce direct noise propagation to NSRs. Further modelling will be conducted to investigate the impact of bunding around the site, platform height reduction and acoustic barriers.

Mitigation During Construction

If felling works are to take place, there is the potential to cause impacts, however, effects would be temporary. British Standard (BS) 5228: 2009 +A1:2014 provides recommended limits for noise from construction sites to meet a maximum 65 dB limit at receptors. The mitigation required would likely involve restricting the working hours to daytime weekdays.

Even if the construction noise limit is met, it is best practice that construction noise should continue to be controlled with a Construction Noise Management Plan (CNMP). In accordance with the guidance and procedures outlined in BS 5228-1 a CNMP may include:

- Minimising the noise as much as is reasonably practicable at source;
- Attenuation of noise propagation;
- Carrying out identified high noise level activities at a time when they are least likely to cause a nuisance to residents; and
- Providing advance notice of unavoidable periods of high noise levels to residents.

In order to maintain low impact on the noise environment, consideration will be given to attenuation of construction noise at source by means of the following:

- Giving due consideration to the effect of noise, in selection of construction methods;
- Avoidance of vehicles waiting or queuing, particularly on public highways or in residential areas with their engines running;
- Scheduling of deliveries to arrive during daytime hours only. Care should be taken to minimise noise while unloading delivery vehicles. Delivery vehicles should follow routes that minimise use of residential roads;
- Ensure plant and equipment are regularly and properly maintained. All plant should be situated to sufficiently minimise noise impact at nearby properties;
- Fit and maintain silencers to plant, machinery, and vehicles where appropriate and necessary;
- Operate plant and equipment in modes of operation that minimise noise, and power down plant when not in use; and
- Use electrically powered plant rather than diesel or petrol driven, where this is practicable.

- Working typically will not take place outside of hours defined in the construction schedule.

Consideration will be given to the attenuation of construction noise in the transmission path by means of the following:

- Locate plant and equipment liable to create noise as far from noise sensitive receptors as is reasonably practicable or use natural land topography to reduce line of sight noise transmission;
- Noise screens, hoardings and barriers should be erected where appropriate and necessary to shield high-noise level activities; and
- Provide lined acoustic enclosures for equipment such as static generators and when applicable portable generators, compressors and pumps

In setting working hours, consideration is given to the fact that the level of noise through the normal working day is more easily tolerated than during the evening and night-time. As the work is short term in nature, working can continue into the evenings, as long as the noise limits are adhered to.

Mitigation During Operation

If mitigation is required during operation of the Proposed OHL Developments, the first stage would be to change the source of noise, the conductor, to a lower noise conductor that still fulfils the power transfer requirements of the overhead line. If the conductor type cannot be changed, then conductors can be aged or bead-blasted to reduce noise at the source.

If mitigation is required during operation of the Proposed Substation Developments, then the first stage would be to change equipment to lower noise equipment, if this is not practicable then acoustic enclosures or barriers can be installed on the propagation path.

11.5 Preliminary Assessment of Likely Significant Effects

Construction activities and traffic, as well as any felling required, have the potential to cause noise and vibration impacts on NSRs during the construction phase. A CNMP will be necessary to mitigate any predicted effects, which could include measures such as limiting working hours. However, due to the uncertainties around OHL alignment, towers, conductors, and substation equipment and design at this stage, it is proposed that noise and vibration effects during construction are included in the EIA and reported in the EIAR.

Operational noise may be emitted from OHL conductors via a phenomenon known as corona discharge. Transformers and other electrical equipment associated with substation developments emit prominent tones due to a phenomenon known as magnetostriction. These effects will be considered and evaluated in the EIA and the findings, including any predicted significant residual effects, reported in the EIAR.

There are no known vibrational noise issues associated with the operation of the Proposed Development at nearby NSRs.

Issues Scoped Out

As noted above, commissioned OHLs and substations do not produce vibration effects as part of operation; hence operational vibration is scoped out of the assessment.

11.6 Proposed Scope and Assessment Methodology

Proposed Scope of Assessment

The assessment methodology has not been discussed with North Lanarkshire Council, Falkirk Council, or the Environmental Health Officer (EHO) to date. The EHO will be consulted to confirm that the following methodology of assessment is appropriate.

Additional mitigation measures will be outlined where required, should there be any significant impacts at the noise sensitive receptors.

Assessment Methodology

Construction Noise Assessment

The assessment of construction noise will comply with the following standards and guidance.

British Standard 5228-1:2009 +A1:2014 (BS 5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites.

Guidance on the prediction and assessment of noise and vibration from construction sites is provided in British Standard (BS) 5228 2009 +A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. BS 5228-1 provides recommended limits for noise from construction sites.

The Construction Noise Impact Assessment (CNIA) would be carried out according to the ABC method specified in Table E.1 of BS 5228-1, in which noise sensitive receptors (NSRs) are classified in categories A, B or C according to their measured or estimated background noise level.

In line with best practice (BS 5228-1), a CNMP will be developed by the Principal Contractor prior to starting construction works. The details of the CNMP will be agreed with North Lanarkshire Council and Falkirk Council and is expected to be secured by an appropriately worded condition of consent.

Operational Noise Assessment

The assessment of operational noise will comply with the following standards and guidance.

Planning Advice Note (PAN) 1/2011: 'Planning and Noise'

Published in March 2011, this document provides advice on the role of the planning system in helping to prevent and limit adverse effects of noise. Information and advice on noise assessment methods are provided in the accompanying Technical Advice Note (TAN): Assessment of Noise. Included within the PAN document and the accompanying TAN are details of the legislation, technical standards, and codes of practice for specific noise issues.

Neither PAN 1/2011 nor the associated TAN provides specific guidance on the assessment of noise from fixed plant, but the TAN includes an example assessment scenario for 'New noisy development (incl. commercial and recreation) affecting a noise sensitive building', which is based on BS 4142:1997: Method for rating industrial noise affecting mixed residential and industrial areas. This British Standard has been replaced with BS 4142:2014: Methods for rating and assessing industrial and commercial sound.

British Standard 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound (BS 4142)

British Standard 4142 describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and / or commercial site.

The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

In accordance with the assessment methodology, the specific sound level ($LA_{eq,T}$) of the noise source being assessed is corrected, by the application corrections for acoustic features, such as tonal qualities and / or distinct impulses, to give a "rating level" ($LA_{r,Tr}$). The British Standard effectively compares and rates the difference between the rating level and the typical background sound level ($LA_{90,T}$) in the absence of the noise source being assessed.

The British Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) when the noise source in question is likely to operate or is proposed to operate in the future.

Comparing the rating level with the background sound level, BS 4142 states:

- *"Typically, the greater this difference, the greater the magnitude of impact;*
- *a difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and*
- *the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

TGN(E)322 – Operational Audible Noise Assessment Process for Overhead Lines

The National Grid has derived a procedure to assess the impact of OHL noise in both dry and rainy conditions. The guidance of the British Standard BS 4142: 2014 can also be used to assess the impact of the noise from a specific industrial source at NSRs.

The procedure requires a series of assessments to be conducted in tiers. Tier 3 requires that the background noise (BGN) at NSRs within a set distance from the OHL (usually 500 m) be measured during quiet night times and in dry conditions with little wind. The nature of the ground surface around the sensitive receptors is noted so that the contribution to BGN of the surface noise attributable to the rainfall can be derived from empirically derived curves (Miller curves). The logarithmic sum of the measured BGN and the empirically derived contribution for rainfall is adopted as the BGN level, in rainy conditions, against which to compare the predicted received noise from the OHL. Using the parameters provided in TGN(E)322 the likelihood of an adverse impact can be assessed.

The assessment procedure follows TGN(E)322, and has been conducted in the following stages:

- The outcome of the Tier 1 assessment will determine whether the ‘worst case’ wet noise impact is predicted to be acceptable, or whether further assessment is required;
- The outcome of the Tier 2 assessment will determine whether the combined wet and dry noise impact is acceptable, or whether further assessment is required;
- The outcome of the Tier 3 assessment will determine whether the noise impact is acceptable, whether the noise needs to be mitigated and minimized or whether the noise is unacceptable;
- The Tier 3 assessment takes account of existing background sound levels in the area and noise levels due to rainfall;
- The attended collection of night-time BGN levels at NSRs, or groups of such NSRs, within a set distance from the centreline found in a Tier 3 Assessment of the OHL during suitable dry weather conditions, before construction;
- Allowance for the effects of rainfall on BGN;
- Prediction of contribution from conductors; and
- Determination of total excess at the most likely rain rate.

11.7 Summary

This chapter outlines the tasks to be undertaken during the EIA with regards to Noise and Vibration. Any potential impacts likely to have a significant effect on the NSRs, with respect to operational noise and construction noise of the Proposed Development, will be evaluated within the EIA Report.

The noise and vibration chapter of the EIAR will consider the following potential impacts:

- Noise and vibration during the construction phase; and
- Operational effects of noise from the OHL.

The assessment will initially consider noise sensitive receptors that are within 500 m of the proposed overhead line alignment. An initial assessment of desktop calculations will be performed to determine the source noise of the proposed conductor type, this calculation will determine the distances that noise sensitive receptors have for potential impact. Any properties that fall within impact zones will undergo baseline noise surveys.

Construction noise will be assessed to BS 5228 standard.

Operational noise will be assessed to BS 4142 standard with guidance from TGN(E)322.

There are no known vibrational noise issues associated with the operation of the Proposed Development at nearby NSRs. Therefore, it is proposed that vibration from operation is scoped out of the EIA assessment.

12.

**Socio-
economics
and
Recreation**

12. Socio-economics and Recreation

12.1 Introduction

This chapter presents how the socio-economics and recreation assessment will consider the potential significant effects on socio-economic and recreation receptors arising from the construction, operation and decommissioning of the Project (as described in Chapter 2).

This chapter of the Scoping Report describes the methodology and datasets to be used within the socio-economics and recreation assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment and how these will be assessed for the purpose of an EIA.

The Project Scoping Boundary is illustrated on Figure 2.10 (Appendix A). This chapter should be read in conjunction with:

- Chapter 2;
- Chapter 3;
- Chapter 4;
- Chapter 10; and
- Chapter 15.

12.2 Relevant Legislation, Policy and Guidance

Legislation

The following legislation is relevant to socio-economics and recreation:

- Planning (Scotland) Act 2019¹⁵³;
- Climate Change (Emissions Reduction Targets) (Scotland) Act (2019)¹⁵⁴.

National Policy

The following national policies are relevant to socio-economics and recreation:

- NPF4¹⁵⁵;
- Draft Energy Strategy and Just Transition Plan¹⁵⁶;
- Scotland's National Strategy for Economic Transformation¹⁵⁷;

¹⁵³Planning (Scotland) Act 2019 Scottish Government <https://www.legislation.gov.uk/asp/2019/13/contents>

¹⁵⁴Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 (2020) Scottish Government <https://www.legislation.gov.uk/asp/2019/15>

¹⁵⁵National Planning Framework 4 (2023) Scottish Government <https://www.gov.scot/publications/national-planning-framework-4/documents/>

¹⁵⁶Draft Energy Strategy Just Transition Plan (2023) Scottish Government <https://www.gov.scot/publications/draft-energy-strategy-transition-plan/>

¹⁵⁷Scotland's National Strategy for Economic Transformation (2022), Scottish Government (<https://www.gov.scot/publications/scotlands-national-strategy-economic-transformation/>).

- Local Energy Policy Statement¹⁵⁸;
- Green Industrial Strategy¹⁵⁹.

Local Policy

The following national policies are relevant to socio-economics and recreation:

- Falkirk LDP2 (2020)¹⁶⁰;
- The Falkirk Plan 2021 – 2030¹⁶¹;
- The Falkirk Council Plan 2022–2027¹⁶²;
- North Lanarkshire LDP (2022)¹⁶³;
- The Plan for North Lanarkshire (2020)¹⁶⁴.

12.3 Study Area

For the purpose of assessing likely significant effects within the EIAR, the study area for socio-economic impacts varies depending on the effect or type of resource being assessed:

- The potential employment, Gross Value Add (GVA) and skill impacts arising from the Project are considered relative to a study area that represents the principal labour market catchment area for the Project and will be derived based on analysis of reasonable travel times to the Scoping Boundary.
- The assessment of impacts on physical socio-economic receptors will consider those within the Scoping Boundary and the immediately adjacent land, and any direct effects that may occur due to this change.
- The study area for indirect effects on physical socio-economic receptors will be extended to include communities that may potentially be affected by the Project, for example through access or severance.

12.4 Baseline

Data Sources

The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- National Records of Scotland; Census 2011¹⁶⁵ and 2022¹⁶⁶;

¹⁵⁸ Local Energy Policy Statement (2021), Scottish Government <https://www.gov.scot/publications/local-energy-policy-statement/>.

¹⁵⁹ Green Industrial Strategy (2024), Scottish Government <https://www.gov.scot/publications/green-industrial-strategy/documents/>.

¹⁶⁰ Falkirk Local Development Plan 2 (2020), Falkirk Council [Development planning: Falkirk Local Development Plan 2 - Falkirk Council](https://www.falkirk.gov.uk/media/101121/Falkirk-Local-Development-Plan-2-2020.pdf)

¹⁶¹ The Falkirk Plan 2021–2030 (2021), Falkirk Council <https://falkirkcommunityplanning.co.uk/wp-content/uploads/2022/10/Final-Falkirk-Plan-021121.pdf>

¹⁶² Council Plan 2022–2027 (2022), Falkirk Council [Policies and strategies: Council Plan 2022 - 2027 - Falkirk Council](https://www.falkirk.gov.uk/media/101121/Falkirk-Council-Plan-2022-2027.pdf)

¹⁶³ North Lanarkshire Council Local Development Plan (2022), North Lanarkshire Council <https://www.northlanarkshire.gov.uk/planning-and-building/development-plans/current-north-lanarkshire-local-development-plan>

¹⁶⁴ The Plan for NLC (2020), North Lanarkshire Council <https://www.northlanarkshire.gov.uk/sites/default/files/2020-10/The%20Plan%20for%20NLC%20v.3%20accessible.pdf>

¹⁶⁵ Scotland's Census 2011 (2011) National Records of Scotland <https://www.scotlandscensus.gov.uk/>

¹⁶⁶ Scotland's Census 2022 (2022) National Records of Scotland <https://www.scotlandscensus.gov.uk/>

- Scottish Government; Scottish Index of Multiple Deprivation 2020¹⁶⁷; and
- National Records of Scotland; Population Projections for Scottish Areas 2018-based¹⁶⁸.

Socio-Economic Profile

Given the size of the Scoping Boundary, local authority level geography has been used to present the baseline for this assessment. Local Authority level data will be provided for the districts of Falkirk and North Lanarkshire combined to form the baseline study area along with the national comparator of Scotland. For the remainder of this subsection (12.4), the term “Baseline Study Area” refers to this defined area for the purpose of presenting context of the socio-economic profile.

Demographics

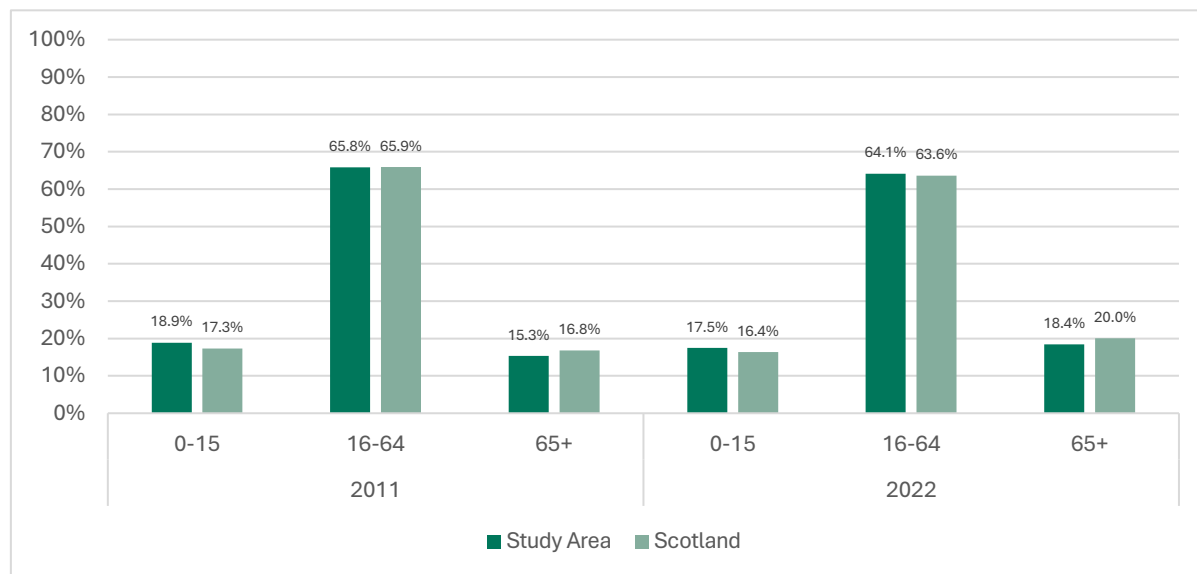
The Scottish Census provides data on populations and age demographics within the Baseline Study Area (Falkirk and North Lanarkshire), and the national comparator of Scotland.

Figure 12-1 showcases the proportion of individuals by age band across the Baseline Study Area. In 2011, 65.8% of the Baseline Study Area was aged between 16 and 64, similar to the Scottish average of 65.9%. The Baseline Study Area also had the highest proportion of individuals aged 0-15 (18.9%), greater than the national average (17.3%), and a lower population aged 65 and over (15.3%) compared to Scotland (16.8%). Data indicates the Baseline Study Area has exhibited an ageing population, as the population aged 65+ increased to 18.4% by 2022. This is reflected across Scotland with the proportion of individuals aged 65+ increasing to 20.0%. The proportion of individuals aged 16-64 and 0-15 has decreased in the Baseline Study Area to 64.1% and 17.5% respectively. This scenario is similar in Scotland where the working age population decreased to 63.6%, and the population of 0–15-year-olds decreased to 16.4%.

¹⁶⁷ Scottish Index of Multiple Deprivation 2020 (2020) Scottish Government <https://www.gov.scot/collections/scottish-index-of-multiple-deprivation-2020>

¹⁶⁸ Population Projections for Scottish Areas 2018-based (2020) Public Health Scotland
<https://www.nrscotland.gov.uk/publications/population-projections-for-scottish-areas-2018-based/>

Figure 12-1 Population Cohorts



Source: Scottish Census (2011 and 2022)

Economic Activity

The Scottish Census showcases economic activity rates for all people aged over 16, as displayed in Table 12-1. The Baseline Study Area has a higher proportion of individuals who are economically active (excluding full-time students) at 59.3%, compared to 56.9% for Scotland overall. However, the proportion of economically active full-time students is slightly lower in the Baseline Study Area (3.3%) compared to Scotland (4.0%). The unemployment rate in the Baseline Study Area is 2.0%, which is marginally higher than Scotland's rate of 1.9%. Conversely, the economically inactive population is lower in the Baseline Study Area (37.4%) compared to Scotland (39.1%), suggesting a more engaged workforce in the Baseline Study Area overall.

Table 12-1 Economic Activity

Economic Activity Indicator	Baseline Study Area	Scotland
Economically active (excluding full-time students) (%)	59.3%	56.9%
Economically active (full-time students) (%)	3.3%	4.0%
Unemployed (excluding full-time students) (%)	2.0%	1.9%
Economically Inactive (%)	37.4%	39.1%

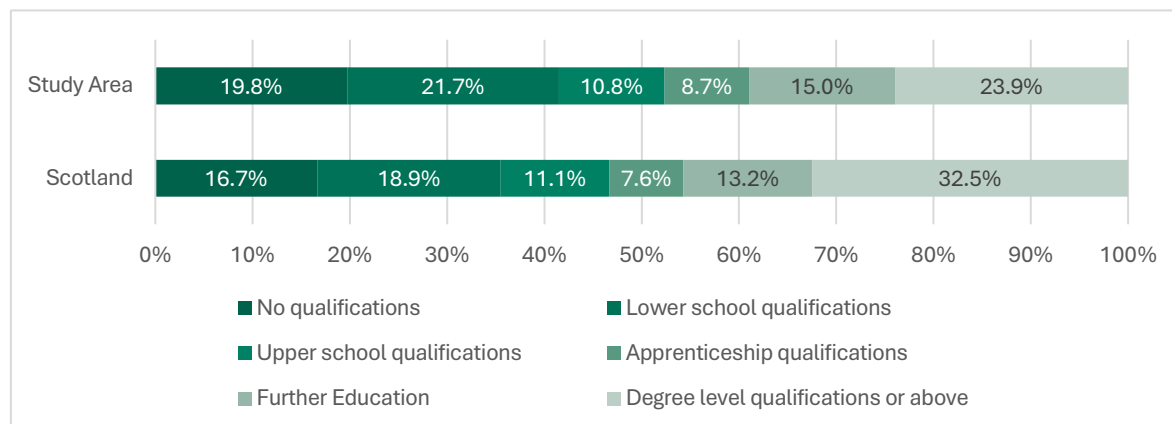
Source: Scottish Census (2022).

Qualifications

Data from the Scottish Census shows that the Baseline Study Area has a lesser educated population in comparison to Scotland. Of the Baseline Study Area's 16+ population, 23.9% were qualified to degree level and above in 2022, compared to 32.5% in Scotland. The

Baseline Study Area had a higher proportion of individuals with no qualifications (19.8%) compared to the national average of 16.7%. This can be seen in Figure 12-2.

Figure 12-2 Qualifications



Source: Scottish Census (2022).

Employment by Industry

The most prevalent sectors for employment in the Baseline Study Area are Human Health and Social Work Activities (14.0%), Wholesale and Retail Trade (12.3%), and Public Administration and Defence (10.4%), exceeding Scotland's overall shares in these categories. Manufacturing (9.8%) and Construction (9.3%) also feature prominently, with higher employment shares in the Baseline Study Area compared to Scotland. Conversely, the Baseline Study Area has lower employment in sectors like Agriculture, Forestry, and Fishing (0.4%), Education (6.9%), and Accommodation and Food Services (5.0%), where Scotland demonstrates relatively higher employment levels. Table 12-2 showcases this data.

Table 12-2 Employment by Industry

Industry	Baseline Study Area	Scotland
Agriculture; Forestry; Fishing	0.4%	1.6%
Mining and Quarrying	0.8%	1.6%
Manufacturing	9.8%	8.0%
Electricity, Gas, Steam and Air Conditioning Supply	0.7%	0.7%
Water Supply; Sewage; Waste Management and Remediation activities	0.9%	0.7%
Construction	9.3%	7.3%
Wholesale and Retail trade; Repair of Motor Vehicles and Motorcycles	12.3%	11.2%

Industry	Baseline Study Area	Scotland
Transport and Storage	6.5%	4.9%
Accommodation and Food Service Activities	5.0%	6.9%
Information and Communication	2.4%	2.9%
Financial and Insurance Activities	4.6%	4.3%
Real Estate Activities	0.9%	1.0%
Professional Scientific and Technical Activities	4.4%	5.8%
Administrative and Support Service Activities	4.9%	4.7%
Public Administration and Defence; Compulsory Social Security	10.4%	9.1%
Education	6.9%	8.2%
Human Health and Social Work Activities	14.0%	14.6%
Arts, Entertainment and Recreation	2.1%	2.7%
Other Service Activities	3.4%	3.6%
Activities of Household as Employers; Undifferentiated Goods - and Services - Producing Activities of Households for Own Use	0.1%	0.1%

Source: Scottish Census (2022).

Deprivation

The 2020 Scottish Index of Multiple Deprivation (SIMD) is a relative measure of deprivation across 6,976 Data Zones. The overall SIMD 2020 deprivation rank for each of Scotland's datazones is grouped into deciles across the whole of Scotland – decile 1 (d1) being the most deprived and d10 the least deprived. Councils with more of its zones distributed into ranks 1-3 have a greater percentage of its population living in deprived areas.

The data shows that on average, 9.9% of the Baseline Study Area's datazones are ranked in d1, 15.6% in d2, and 13.5% in d3. This highlights the Baseline Study Area is moderately deprived, with 39.0% of datazones ranking in the top 3 most deprived deciles.

Local Receptors

Local and Private Assets

The Baseline Study Area (local authorities of Falkirk and North Lanarkshire) incorporates several population centres in relative proximity to the current Preferred Route Option. These

communities currently contain built up settlements, which are likely to accommodate residential properties, agricultural land, community facilities, businesses, open spaces and visitor attractions. At this scoping stage, a high-level identification of example receptors which are deemed to have the potential for impacts as a result of the Project are presented in Table 12-3. This is not an exhaustive account but does provide examples of local receptors that will be included within the scope of the socio-economic assessment.

Table 12-3 Social Infrastructure

Local Authority	Community / Settlement	Project Section / Part	Example Receptors
Falkirk	• Denny	• New-build overhead line	• Residential receptors in the communities listed (including built-up areas, sparse properties, and agricultural properties)
	• Falkirk	• Up-rated overhead line (Route ZG)	• Dunipace Football Club
	• Stenhousemuir	• Ancillary lines (Route CB removal; Route AA undergrounding)	• Denny High School
	• Bonnybridge	• Denny North Substation	• Forth Valley Royal Hospital
		• Bonnybridge Substation	• Larbert Loch
			• Found Church
			• Falkirk Tryst Golf Club
			• The Falkirk Wheel
			• The Boardwalk restaurant
			• Bonnybridge Golf Course
North Lanarkshire	• Cumbernauld	• New-build overhead line	• Residential receptors in the communities listed (including built-up areas, sparse properties, and agricultural properties)
	• Glenmavis / New Monkland	• Up-rated overhead line (Route XX; Route XR)	• Palacerigg Country Park
	• Airdrie	• Ancillary lines (Route CB removal; Route AA undergrounding)	• Drumpellier Country Park
	• Coatbridge		• World of Wings
	• Chapelhall		• The Church of Jesus Christ of Latter-day Saints
	• Newarthil		
	• Holytown		
	• Cleland		

Local Authority	Community / Settlement	Project Section / Part	Example Receptors
	• Allanton • Wishaw • Overtown • Morningside • Cambusnethan • Newmains	• Cumbernauld Substation • Easterhouse Substation • Wilshaw Substation	• Palacerigg Golf Course • Cumbernauld train station • New Monkland Primary School • Glenmavis Community Centre • Albert Bartlett Stadium • Drumgelloch train station • Townhead Primary School • St. Bartholomew's Catholic Church • Chapelhall Surgery • Holytown Crematorium • Holytown Primary School & Nursery Class • Holytown Parish Church • Cleland Hospital • Allanton Church & Community Café • Orchard Primary School • Waterloo Park • Pather Park • Shankly Drive Playground • Cambusnethan Cemetery • St Brigid's Catholic Church

Core Paths

A number of core paths are located within and in close proximity to the Project. Presence of any Core Paths in proximity to the Scoping Boundary will be established at ES stage through a comprehensive review.

Development Land

Presence of any development land in proximity to the Scoping Boundary will be established at EIA stage through a review of planning applications and Local Plan allocations.

Future Baseline

2040 is considered as the baseline year, as it represents a practical timeframe for planning and decision-making while maintaining a reasonable degree of accuracy and reliability. The future baseline is anticipated to be largely the same as the existing baseline for socio-economics and recreation. According to the National Records of Scotland Population Projections, the population of North Lanarkshire is forecasted to decrease from 341,134 in 2018 to 338,453 in 2040, representing a 0.8% decrease. The population of Falkirk is expected to increase from 163,675 in 2024 to 169,264 in 2040, representing a 3.4% increase. The overall population of Scotland is forecasted to grow 1.3% between 2024 and 2040, from 5,504,866 to 5,574,675. These projections are based off 2018 data which use assumed levels of future fertility, mortality and migration. The projections did not consider the findings of the Census 2021.

In terms of the local economy, it would be reasonable to expect that employment and GVA would increase, associated with the expected increase in population. It is expected that core paths will continue to be used. Businesses and community facilities may open and close; however, it is not expected that there will be any perceptible changes to the local economic baseline assessment and the Project should be assessed against current baseline conditions and policies. These changes are not considered to constitute significant changes to the baseline.

12.5 Assessment Methods

For socio-economics, there is no accepted definition of what constitutes a likely significant (or not significant) socio-economic effect. It is recognised that 'significance' reflects the relationship between the scale of impact (magnitude) and the sensitivity (or value) of the affected resource or receptor. As such, the significance criteria for socio-economic effects has been assessed using the expert judgement of authors with professional experience in socio-economics, and relies on the following considerations:

- The sensitivity of a given receptor: the assessment takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor, particularly their ability to respond to change based on the given impacts of the Project; and
- The magnitude of the impact: this entails consideration of the size of the impact, for example, on people, businesses, users of core paths, private properties, employees and development land in the context of the area in which impacts will be experienced.

These factors have then been combined to determine the consequent likely significance of the effect.

The sensitivity of socio-economic receptors is assessed as high, medium, low or very low. The criteria for assessing and classifying levels of receptor sensitivity used within the assessment are defined in Table 12-4, based on professional judgement.

Table 12-4 Sensitivity Classification

Level of Sensitivity	Classification
High	There are limited / no comparable and accessible alternatives to the receptor that exist within the relevant catchment area; and / or receptors have limited ability to absorb the change.
Medium	There are limited comparable and accessible alternatives to the receptor within the relevant catchment area; and / or receptors have limited ability to absorb the change.
Low	Receptors are able to relatively easily absorb the change; and / or there are some comparable and accessible alternatives to the receptor that exist within the relevant catchment area.
Very low	Receptors are able to relatively easily absorb the change; and / or there are many comparable and accessible alternatives to the receptor that exist within the relevant catchment area.

The magnitude of the socio-economic impacts associated with the Project have been assessed as being high, medium, low or very low – these are defined in Table 12-5. The receptors detailed in the receptor sensitivity criteria are also considered for the magnitude criteria. This has been determined with regard to:

- Extent of change – the absolute number of people affected and the size of area in which the impact will be experienced (i.e. the level of change to baseline conditions including the proportion of the existing workforce);
- Scale of the impact – the relative magnitude of each impact in its relevant market context (for example, the impacts on local employment will be considered in the context of the overall size of the local labour market); and
- Duration of impact – more weight is given to long-term, permanent changes than to short-term, temporary ones. Temporary to short-term impacts are those associated with the construction works. Medium to long-term impacts are those associated with the operation of the Project.

Table 12-5 Magnitude Classification

Level of Sensitivity	Classification
High	An impact that is expected to have considerable adverse or beneficial socio-economics effects. Such impacts will

Level of Sensitivity	Classification
	typically affect large numbers of businesses, workers or residents.
Medium	An impact that will typically have a noticeable effect on a moderate number of businesses, workers or residents, and will lead to a small change to the Study Area's baseline socio-economic conditions.
Low	An impact that is expected to affect a small number of businesses, workers or residents or an impact that may affect a larger number of receptors but does not materially alter the Study Area's baseline socio-economic conditions.
Very low	An impact which has very little change from baseline conditions where the change is barely distinguishable, approximating to a 'no change' situation.

To determine the overall significance of effects of the Project, effects have been defined in line with the following:

- Beneficial – advantageous or positive effect to an environmental resource or receptor;
- Negligible – imperceptible effect to an environmental resource or receptor;
- Adverse – detrimental or negative effects to an environmental resource or receptor; and
- No effect – no discernible effects on a receptor.

Where an effect is assessed as being beneficial or adverse, the effect has been classified as Major, Moderate, Minor or Negligible. The assessment of significance is informed by considering the sensitivity of the receptor and the magnitude of impact as set out in Table 12-6. For the purposes of this assessment, only likely Moderate and Major effects are considered 'significant'.

Table 12-6 Significance of Effects Matrix

		Sensitivity of Receptor			
		High	Medium	Low	Very low
Magnitude of Impact	High	Major	Moderate	Moderate	Minor
	Medium	Moderate	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible

		Sensitivity of Receptor			
		High	Medium	Low	Very low
	Very low	Minor	Negligible	Negligible	Negligible

The assessment will be carried out using a number of recognised data sources and, wherever possible, the impacts of the socio-economic assessment will be appraised against relevant national standards such as those provided by HM Treasury and Homes and Communities Agency (now Homes England). Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

12.6 Identification of Potential Effects

Table 12-7 summarises the potential socio-economic and recreation impacts from the Project that will be included in the socio-economics and recreation assessment at EIA stage. Justifications are provided where impacts have been scoped in and out. For decommissioning impacts, it is assumed that the scenario will be largely comparable to the construction phase. Therefore, in Table 12-7, where construction is scoped in, decommissioning will also be.

Substation Works

As part of the Project, works are required at a number of existing substations to facilitate the increase in operating voltage to 400kV. The following substation extension will be scoped into the Socio-economic and Recreation assessment:

- **Cumbernauld Substation** – works are limited to an extension to the south of the existing substation with the installation of new electrical equipment and an extension to the platform requiring earthwork remodelling and security fence. These works would be seen within the context of the existing substation. However, given that there are numerous potential sensitive receptors in the vicinity of the substation (including Palacerigg Country Park, and residential and community receptors in the immediate built-up settlement), it is considered appropriate that the substation extension works are included.

The following substation extensions will be scoped out of the Socio-economic and Recreation assessment:

- **Denny North Substation** – works will be limited to the northern side of the existing substation with the installation of a new bay and an OHL gantry tower along with an extension to the existing security fence. These works would be within the context of the existing substation. In addition, there are no likely sensitive receptors in the vicinity of the substation, and consequently it is considered that they would not give rise to potentially significant effects;
- **Bonnybridge Substation** – works will be limited to an extension to the southwest of the existing substation with the installation of new electrical equipment and an extension to the platform and security fence. These works would be within the context of the existing

substation. In addition, there are no likely sensitive receptors in the vicinity of the substation, and consequently it is considered that they would not give rise to potentially significant effects;

- **Easterhouse Substation** - Works at Easterhouse Substation are small-scale and comprise a minor extension of the fence line on the eastern side of the substation to allow for installation of new equipment. While there are a small number of socio-economic receptors present, any effects would be limited in their extent, temporary occurring for the duration of construction only and could be reduced with standard mitigation measures. As a result it is proposed to scope Easterhouse Substation out of the EIA; and
- **Wishaw Substation** - Works at Wishaw Substation are small-scale and comprise a minor extension of the platform and fence line within the context of the existing substation to allow for installation of new equipment. While there are a small number of socio-economic receptors present, any effects would be limited in their extent, temporary occurring for the duration of construction only and could be reduced with standard mitigation measures. As a result it is proposed to scope Easterhouse Substation out of the EIA.

Scope of Socio-economic and Recreation Assessment by Determinant

Table 12-7 Scope of Socio-economic and Recreation Assessment

Determinant	Project Sections Scoped In / Out	Project Phase Scoped in for	Rationale
Employment and GVA generation	Scoped in: • New-build overhead line including ancillary lines; • Up-rated overhead line; • Cumbernauld substation; • Easterhouse substation; and • Wishaw substation. Scoped out: • N/a	• Construction	The Project may require a construction workforce that could have potential significant beneficial impacts on employment and job generation during construction. However, operational works associated with the Project are likely to generate a limited number of jobs. Therefore, employment and GVA impacts during operation are likely to be beneficial but not significant.
Pressure on local accommodation facilities	Scoped in: • N/a Scoped out: • New-build overhead line	N/a	The size of the construction and operational workforce is unlikely to put pressure on the local temporary accommodation sector.

Determinant	Project Sections Scoped In / Out	Project Phase Scoped in for	Rationale
	- including ancillary lines; • Uprated overhead line; • Cumbernauld substation; • Easterhouse substation; and • Wishaw substation.		A 60-minute drive time is typically used in socio-economic assessments as the area in which accommodation will be taken up by non-local workers. For the Project, this area encompasses highly developed, metropolitan areas like Glasgow, where there is likely substantial capacity to accommodate workers.
Promotion and provision of training and apprenticeship opportunities	Scoped in: • New-build overhead line including ancillary lines; • Uprated overhead line; • Cumbernauld substation; • Easterhouse substation; and • Wishaw substation. Scoped out: • N/a	• Construction	The Project may offer temporary training and upskilling opportunities such as apprenticeships during construction which have the potential to be significant due to the large number of construction jobs required. However, operation of the Project is not likely to generate many jobs and, therefore, no significant impacts are expected relating to training and apprenticeships.
Disruption to access to core paths	Scoped in: • New-build overhead line including ancillary works; • Uprated overhead lines; Scoped out: • Denny North Substation	• Construction	The Project may result in disruption / reduced access to core paths for users through diversions and temporary closures during construction which may cause significant adverse effects. Impacts on core paths (including any permanent impacts) are likely to occur during construction and would be assessed as

Determinant	Project Sections Scoped In / Out	Project Phase Scoped in for	Rationale
	- Bonnybridge Substation - Cumbernauld Substation - Easterhouse substation - Wishaw substation.		construction phase effects. Impacts on core paths arising from the construction and operation of the proposed substations due to no core paths being in the immediate vicinity and therefore would not be directly affected. Any effects on core paths arising from maintenance activities would be minimal and not likely to be significant. Therefore, impacts on core paths are scoped out of operation.
Impacts on local and private assets (including residential properties, local businesses, open space / recreation receptors, community facilities and visitor attractions via direct works or indirect severance / amenity impacts identified by other disciplines assessments)	Scoped in: - New-build overhead line including ancillary lines; - Upgraded overhead lines; Scoped out: - Denny North substation; - Bonnybridge substation - Cumbernauld substation; - Easterhouse substation; and - Wishaw substation.	Construction	The Project may result in disruption / reduced access to assets as well as impacts upon the amenity of these assets. Effects on local and private assets are not likely beyond the construction phase, as activities associated with the Project such as maintenance will be minimal and unlikely to cause significant effects. There is no overlap of assets and access to the proposed substations therefore they are scoped out of the operation.
Impacts on agricultural land	Scoped in: N/a	N/a	The Project is not expected to impact agricultural land use

Determinant	Project Sections Scoped In / Out	Project Phase Scoped in for	Rationale
	Scoped out: - New-build overhead line including ancillary lines; - Uprated overhead lines; - Denny North Substation - Bonnybridge Substation - Cumbernauld substation; - Easterhouse substation; and - Wishaw substation.		during construction, on the basis that the land capability for agriculture confirms the area doesn't support the equivalent of best or most versatile land (BMV), and the scale of impact is anticipated to be very limited. Significant impacts on agriculture land take during operation are not expected due to the minimal activities associated with operation of the Project.
Impacts on development land	Scoped in: - New-build overhead line including ancillary lines Scoped out: - Uprated overhead lines - Denny North substation; - Bonnybridge substation; - Easterhouse substation; - Cumbernauld substation; and - Wishaw substation	Construction	The Project has been designed with regard to policy allocations for development, therefore impacts on development land will be limited to a search of non-allocated planning applications for the new-build OHL.

12.7 Summary of Proposed Scope

Impacts on socio-economic and recreation receptors associated with the Project that have been scoped into the assessment at EIAR stage have been set out in Table 12-7. Impacts on socio-economic and recreation receptors have been scoped out during operation due to the limited operational works associated with the Project. Impacts during construction and decommissioning have been scoped in.

Table 12-8 provides a summary of the project components where the Socioeconomics and Recreation EIA topic has been scoped in.

Table 12-8 Summary of Proposed Scope – inclusion of Socio-Economics and Recreation Topic within EIARs

Project Component	Phase	Socio-Economics and Recreation Topic scoped in / out?	Rationale (only where Topic is scoped out)
New-build overhead line	Construction	Scoped in	
	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant. The size of the operational workforce is unlikely to put pressure on local temporary accommodation. Operation of the Project is not likely to generate a significant number of jobs. Impacts on core paths arising from operational maintenance would be minimal.
Upgraded overhead line (ZG Route)	Construction	Scoped in	
	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant. The size of the operational workforce is unlikely to put pressure on local temporary accommodation. Operation of the Project is not likely to generate a significant number of jobs. Impacts on core paths arising from operational maintenance would be minimal.
	Construction	Scoped in	

Project Component	Phase	Socio-Economics and Recreation Topic scoped in / out?	Rationale (only where Topic is scoped out)
Upgraded overhead line (XX Route)	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant.
			The size of the operational workforce is unlikely to put pressure on local temporary accommodation.
			Operation of the Project is not likely to generate a significant number of jobs.
			Impacts on core paths arising from operational maintenance would be minimal.
Upgraded overhead line (XR Route)	Construction	Scoped in	
	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant.
			The size of the operational workforce is unlikely to put pressure on local temporary accommodation.
			Operation of the Project is not likely to generate a significant number of jobs.
CB Route Removal and AA Route Ungrounding	Construction	Scoped in	
	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant.
			The size of the operational workforce is unlikely to put pressure on local temporary accommodation.

Project Component	Phase	Socio-Economics and Recreation Topic scoped in / out?	Rationale (only where Topic is scoped out)
Denny North Substation	Construction	Scoped out	Operation of the Project is not likely to generate a significant number of jobs.
	Operation	Scoped out	Impacts on core paths arising from operational maintenance would be minimal.
Bonnybridge Substation	Construction	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant.
	Operation	Scoped out	The size of the operational workforce is unlikely to put pressure on local temporary accommodation.
	Construction	Scoped out	Operation of the Project is not likely to generate a significant number of jobs.
	Operation	Scoped out	Impacts on core paths arising from operational maintenance would be minimal.
	Construction	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant.
	Operation	Scoped out	The size of the operational workforce is unlikely to put pressure on local temporary accommodation.
	Construction	Scoped out	Operation of the Project is not likely to generate a significant number of jobs.
	Operation	Scoped out	Impacts on core paths arising from operational maintenance would be minimal.

Project Component	Phase	Socio-Economics and Recreation Topic scoped in / out?	Rationale (only where Topic is scoped out)
Cumbernauld Substation	Construction	Scoped in	
	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant. The size of the operational workforce is unlikely to put pressure on local temporary accommodation. Operation of the Project is not likely to generate a significant number of jobs. Impacts on core paths arising from operational maintenance would be minimal.
Easterhouse Substation	Construction	Scoped in	
	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant. The size of the operational workforce is unlikely to put pressure on local temporary accommodation. Operation of the Project is not likely to generate a significant number of jobs. Impacts on core paths arising from operational maintenance would be minimal.
Wishaw Substation	Construction	Scoped in	
	Operation	Scoped out	Employment and GVA impacts during operation are likely to be beneficial but not significant.

Project Component	Phase	Socio-Economics and Recreation Topic scoped in / out?	Rationale (only where Topic is scoped out)
			The size of the operational workforce is unlikely to put pressure on local temporary accommodation. Operation of the Project is not likely to generate a significant number of jobs. Impacts on core paths arising from operational maintenance would be minimal.

13.

**Forestry, Land
Use, and
Agriculture**

13. Land Use, Forestry and Agriculture

13.1 Introduction

This chapter of the Scoping Report provides a brief overview of rural land use for agriculture and forestry baseline conditions, the potential effects associated with the construction and operation of the Project and the proposed scope of the assessment methodology within the EIAR.

Land capability for agriculture is a measure of the versatility and productivity of land. This measure of the physical resource is considered within this chapter. Socio-economic effects on agricultural enterprises are not included within this chapter.

Commercial forests are dynamic, changing through landowner activities and natural events. This would include the changes due to planned felling programmes. Furthermore, the environmental services provided by forestry in relation to habitats and landscape character are recognised within Chapter 5 and 7. However, the potential impact of development on forestry typically requires consideration of forestry land use (resulting from the construction and operation phases of the Project).

13.2 Relevant Legislation, Policy and Guidance

Legislation

A new Agriculture Bill, “Delivering our Vision for Scottish Agriculture”¹⁶⁹ is now at Stage 1 (receiving committee examination) and Scottish Ministers will be required to prepare a five-year Rural Support Plan. This plan will include details of farming, forestry, and rural development support.

The Forestry and Land Management (Scotland) Act 2018¹⁷⁰ makes provision for Scottish Ministers’ functions in relation to the management of forested land and other land, and for connected purposes. Part 4 of the Act relates to tree felling.

National Planning Policy

In the UK there is a strong presumption against permanent deforestation unless it addresses other environmental concerns or where it would achieve significant and clearly defined additional public benefits. In Scotland, such deforestation is dealt with under the Scottish Government’s “Control of Woodland Removal Policy” (2009)¹⁷¹. The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. It will be essential that the requirements of the policy are addressed within the EIA and reported in the EIAR.

¹⁶⁹ Delivering our Vision for Scottish Agriculture. Proposals for a new Agriculture Bill (2022), Scottish Government [Delivering our vision for Scottish agriculture - proposals for a new Agriculture Bill: consultation - gov.scot](https://www.gov.scot/publications/delivering-our-vision-for-scottish-agriculture-proposals-for-a-new-agriculture-bill-consultation/pages/2/)

¹⁷⁰ The Forestry and Land Management (Scotland) Act 2018 (2018), Scottish Government [Forestry and Land Management \(Scotland\) Act 2018](https://www.gov.scot/publications/forestry-and-land-management-act-2018/pages/2/)

¹⁷¹ Control of Woodland Removal Policy (2009), Scottish Government – Forestry Scotland <https://www.forestry.gov.scot/publications/285-the-scottish-government-s-policy-on-control-of-woodland-removal>

Soils are supported within Policy 5 and Forestry, Woodland and Trees within Policy 6 of the NPF4¹⁷². Policy 5 seeks to minimise disturbance of soils from development. Policy 6 establishes the requirement to protect and expand forests, woodland and trees.

Local Planning Policy

North Lanarkshire Local Development Plan (NLLDP) (2022)¹⁷³ includes policy for protecting Natural Environment and Green Network Assets. North Lanarkshire Council will protect natural and resilient sustainable places by safeguarding natural heritage assets. When considering future development affecting the natural environment and the specific Green Network Assets identified in this Policy, the Council will seek guidance where appropriate from NatureScot. North Lanarkshire is one of the eight local authorities covered by the Clyde Valley strategic development plan. The NLLDP cross-references to the Clyde Valley Forest and Woodland Strategy¹⁷⁴ in respect of woodland creation. The Strategy also includes spatial guidance in relation to farmland.

Falkirk Council (FC) has a Forestry and Woodland Strategy 2015-2055, referenced within the Local Development Plan 2¹⁷⁵. The strategy provides a long-term vision for the management and expansion of the woodland resource, which will be taken into account in responding to proposals for felling, planting and restocking, and in making planning decisions on woodland removal or creation.

Guidance

Forestry proposals would be prepared in accordance with current industry best practice and forestry guidance including, but not limited to:

- The UK Forestry Standard, The Government's Approach to Sustainable Forestry¹⁷⁶;
- Scotland's Forestry Strategy 2019 to 2029¹⁷⁷;
- The UK Woodland Assurance Standard¹⁷⁸; and
- Guidance on the Management of Forestry Waste¹⁷⁹.

¹⁷² National Planning Policy 4 (2023), Scottish Government

<https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf>

¹⁷³ North Lanarkshire Local Development Plan

<https://www.northlanarkshire.gov.uk/planning-and-building/development-plans/current-north-lanarkshire-local-development-plan>

¹⁷⁴ Forestry and Woodland Strategy for the Glasgow City Region (2020), Clydeplan (Glasgow and Clyde Valley Strategic

Development Planning Authority) <https://a.storyblok.com/f/243567/x/c35ace668a/clydeplanforestryandwoodlandstrategy.pdf>

¹⁷⁵ Falkirk Local Development Plan 2 (LDP2) (2020), Falkirk Council <https://www.falkirk.gov.uk/development-planning/falkirk-local-development-plan-2>

¹⁷⁶ The UK Forestry Standard (December 2017), The Forestry Commission <https://www.gov.uk/government/publications/the-uk-forestry-standard>

¹⁷⁷ Scotland's Forestry Strategy 2019 to 2029. (February 2019), Scottish Government

<https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2019/02/scotlands-forestry-strategy-20192029/documents/scotlands-forestry-strategy-2019-2029/scotlands-forestry-strategy-2019-2029/govscot%3Adocument/scotlands-forestry-strategy-2019-2029.pdf>

¹⁷⁸ The UK Woodland Assurance Standard Fifth Edition (2024), UKWAS <https://ukwas.org.uk/wp-content/uploads/2024/12/UKWAS-5.0-2024.pdf>

¹⁷⁹ Guidance on the Management of Forestry Waste (SEPA, WST-G-027 version 3) (2017), SEPA https://www.sepa.org.uk/media/28957/forestry_waste_guidance_note.pdf

13.3 Study Area

Baseline conditions identify tree groups and woodland intersecting with the existing corridor and with contiguous areas of woodland beyond the corridor.

The baseline has been derived from Scotland's environmental map¹⁸⁰ and Scottish Forestry map viewer¹⁸¹. These digital mapping tools have enabled identification of land capability for agriculture and woodland areas, within the National Forest Inventory (NFI). Time-sequence aerial imagery and Streetview imagery has been studied using Google Earth Pro¹⁸².

The NFI definition of woodland is a minimum area of 0.5ha with trees possessing, or with the potential to achieve, tree crown cover of more than 20% of the ground. Within the NFI some woodlands are identified as native woodlands. The Native Woodland Survey of Scotland (NWSS) provides a baseline survey of all native woodlands (of minimum 0.5ha), nearly native woodlands and plantations on ancient woodland sites in Scotland. A further subset of these woodlands is contained within the Ancient Woodland Inventory (AWI) of Scotland, which identifies ancient woodland, long established woodland of plantation origin and semi-natural woodlands. However, the AWI is based on woodlands over 2ha. NFI, NWSS and AWI are identified within the baseline conditions.

Agricultural baseline

Class 2 and Class 3.1 land is recognised as prime agricultural land, capable of growing a wide range of crops. Land use is flexible and is suitable for woodland.

Class 3.2 will support a moderate range of crops, including cereals (primarily barley), forage crops and grass. Classes 4.1 and 4.2 represent land capable of producing a narrow range of crops, primarily grassland with short arable breaks.

Sub-classes of land within Class 5 can support improved grassland. Land within Class 6 land is limited to supporting rough grazing.

ZG route lies principally within land capability Classes 3.1 and 3.2, with areas of Class 4.2 and a small area of Class 2 northeast of the cemetery at Dunipace.

CB route includes Class 3.1 land north of the Forth and Clyde canal, but the remainder of this route and all the other routes and New-build Overhead line are principally within Classes 4, 5 and 6, (or land classed as urban) with occasional small pockets of Class 3.2.

Land capability classes at the substation sites are reported below. The footprint of the existing substations would more appropriately now be classed within the urban category but, for most sites, has not been adjusted on 1:50,000 mapping.

¹⁸⁰ Scottish Government (n.d.) Scotland's Environment web map <https://map.environment.gov.scot/sewebmap/>

¹⁸¹ Scottish Forestry (n.d.) Scottish Forestry Map Viewer

<https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18>

¹⁸² Google Earth Pro (n.d.) <https://www.google.com/earth/about/versions/#earth-pro>

Denny North Substation:

Land within Class 5.2 was developed for the existing substation, which is bounded by land within capability Class 3.2 and Class 4.2.

Bonnybridge Substation:

Class 3.1 land was developed for the existing substation and land of the same capability class surrounds the site.

Cumbernauld Substation:

The substation site is within Class 4.2, bounded by a fringe of urban land.

Easterhouse Substation:

Class 3.2 land was developed for the existing substation and extends around the site, with some Class 5.3 land locally.

Wishaw Substation:

The site and surrounding land use is categorised as urban.

Forestry baseline

The forestry baseline is present in Appendix A, Figure 13.1.

The existing ZG route passes south from Denny North Substation, through long-established woodland of plantation origin (LEPO) at Tor Wood. South of the M876, the route passes adjacent to two areas of mixed broadleaf of open canopy structure and through trees on the banks of the River Carron. The route passes through a further area of broadleaf woodland between the Carron and Bonny Water before reaching Bonnybridge Substation.

Both the CB route and the New-build Overhead line pass through LEPO of broadleaved woodland, immediately south of the Forth and Clyde Canal, some of which contains only widely scattered trees.

Howierrig Wood is LEPO, of mostly young trees forming upland birchwood. The New-build Overhead line passes the northern tip of Drum Wood where it meets Rowan Tree Burn. It is identified as LEPO, and inventory data is for conifer trees although aerial imagery of the relevant area, at its northern tip, suggests the woodland contains scattered broadleaves.

South of Beam Road the proposed New-build Overhead line passes between areas of native broadleaf woodland. It then routes through young conifer woodland of mixed ages of principally young trees and which incorporates substantial areas of open ground.

The CB route passes through an extensive area of NFI woodland, the western part of which is known as Forest Wood. Aerial imagery shows areas of trees to be young, including within an area identified as LEPO.

The New-build Overhead line into Cumbernauld Substation passes through LEPO and associated areas of woodland, containing young trees. The area around Cumbernauld Substation is afforested.

South from Cumbernauld the New-build Overhead line passes through areas of forestry inventory land that includes felled areas (and open grassland) as well as conifer plantation.

There is an area of ancient semi-natural woodland around Luggie Water and a conifer woodland south of Hulks Road that would be crossed by the New-build Overhead Line. There are areas of conifer woodland and native wet woodland either side of Brackenknowe Road, north of Wattston and the wet woodland extends westward to Cameron Road. Wet woodland and native deciduous woodland are present on either side of the A73 Stirling Road.

The New-build Overhead line follows a southerly route through felled woodland to the west of the A73 at Riggend and ground prepared for planting (described within the NFI as assumed woodland).

North of Glenmavis, New-build Overhead line connects to the XX route upgrade. XX route to Easterhouse Substation, passes through areas of NFI which principally have been felled or are open land and contain the existing wayleave. The overhead line and wayleave is adjacent to one compartment of conifer woodland. At Easterhouse Substation, broadleaf woodland fringes Woodend Loch.

From Glenmavis, the other section of XX route is an upgrade to the existing overhead line and the descriptions below relate to forestry adjacent to an existing wayleave. XX route proceeds southerly through felled and low-density woodland. Immediately north of Airdrie, the overhead line corridor is adjacent to an area of broadleaf woodland, identified as LEPO.

XX route skirts the eastern edge of Airdrie, passing through areas of broadleaf and conifer woodland. At Inver House Distillers is an area of native wet woodland, classed as LEPO. There are a series of further areas of native wet woodland along XX route before reaching Chapelhall to the south.

Proposals for the upgrade to XX route adjoin proposals for the upgrade to XR route at Torrance Park golf club. The alignment of XR route westward crosses an area of native lowland broadleaves south of Hareshaw. It crosses a series of LEPO woodlands including native birchwood and areas of conifer, some of which are sufficiently extensive and established to be named woodlands. These include Muiredge/Penty/Big Woods and Kennel Knowe/Calkers Wood, which is a LEPO woodland, crossed by XR route, at South Calder Water on the outskirts of Allanton.

South of Allanton XR route crosses areas of broadleaf and conifer woodland. South of Morningside an area of native woodland is at juvenile regeneration stage. XR route crosses a broadleaf treebelt at Auchter Water. North of Waterloo the overhead line passes through broadleaf woodland, proceeding to a native lowland deciduous woodland, north of Overtown. The Overhead line passes groups of young deciduous trees as it reaches Wishaw Substation.

13.4 Identification of Potential Effects

New-build Overhead Line

Land Use

Potential effects on land use require consideration of loss of productive and versatile agricultural land and removal of forest areas. NPF4 recognises that development proposals

on prime agricultural land can be supported where it is for essential infrastructure and there is a specific locational need. There are small amounts of prime agricultural land within the Scoping Boundary. The area of soil sealing is small, and measures can be established within the Construction Environmental Management Plan to prevent compaction and erosion. For the most part, the routes are not within prime agricultural land.

It is proposed that soils in the context of agricultural land use is scoped out.

Forestry

There are potential impacts to forestry. Potentially significant adverse effects on forestry typically include:

- Removal of LEPO;
- Removal of large areas of commercial forest resulting in reduction of shelter and a potential loss of habitat;
- Removal or coppicing of trees within AWI and NWSS woodlands;
- Increased probability of wind throw;
- Disturbance of ground by machinery; and
- Tree debris/mulch remaining on site may cause area to take longer to recover the native ground flora.

Removal of trees in commercial forestry is not necessarily a significant effect if the rotation is at or close to economic felling age. Equally, removal or coppicing of trees from AWI or NWSS woodlands may not present a significant effect if soils remain intact and the measures are appropriate to habitat management objectives.

The creation of new or enhanced access to woodland or within woodland may have a significant positive effect on timber harvesting and extraction.

Forestry is to be scoped into the assessment.

Upated Overhead Lines

It is proposed that soils in the context of agricultural land use is scoped out.

Upated Overhead lines may require an expanded wayleave but currently the applicant does not anticipate this action, thereby avoiding disruption to the canopy of forest areas. The exposure of a new woodland edge may make areas of continuous forestry vulnerable to windthrow. To minimise windthrow risk, extended felling may be appropriate back to a windfirm edge, provided by, for example, a topographical feature such as a stream or the forestry compartment boundary. The potential for adverse effects adjacent to upated Overhead lines would only result from an expanded wayleave.

Forestry is to be scoped out of the assessment on the basis that wayleaves will not require tree removal. However, should forestry removal be subsequently proposed localised assessment would be undertaken as appropriate.

Substation Works

There are potential effects on Classes 3.1 and 3.2 soils, at Denny North and Easterhouse Substations. Nonetheless it is proposed that soils, in the context of agricultural land, are scoped out for all sites based on the magnitude of impacts.

Substation works are scoped out where forestry, as defined in this Scoping Report, is not present, as follows:

Denny North Substation

The proposed works to Denny North Substation works would not affect forestry and is scoped out of assessment.

Bonnybridge Substation

Proposed works at Bonnybridge Substation are anticipated to affect individual trees but not forestry. Assessment of individual trees and tree groups (of smaller areas than the definition of forestry in this chapter) is an arboricultural impact assessment. Arboricultural impact assessment is scoped out.

Cumbernauld Substation

The area around Cumbernauld Substation is forested. The proposed works are scoped into forestry assessment.

Easterhouse Substation

Trees on the shore of Woodend Loch, adjacent to the Easterhouse Substation are considered forestry. It is not anticipated that the proposals for the Easterhouse Substation would affect this area of forestry and it has been provisionally scoped out.

Wishaw Substation

The proposed works to Wishaw Substation would not affect forestry and is scoped out of assessment.

13.5 Assessment Methods

It is proposed to scope out agricultural land use. North of the Forth and Clyde Canal, land capability affords wider options for agricultural cropping but effects of uprating of the existing network would be negligible. South of the Forth and Clyde Canal, land capability is principally within Classes 4, 5 and 6 and the New-build Overhead line will have limited effect on soils and land use.

Forestry will be scoped in but not for all elements. Initial identification has been provided using aerial photography, Scottish Forestry mapper¹⁸¹ and Scotland's Environmental map¹⁸⁰. Further assessment of forestry will utilise forest compartment management plan records if they are made available to the Applicant by forest owners or agents. Forestry data for existing above ground infrastructure will rely particularly on the most recent resilience data to be provided by the Applicant, with ground-truthing where extended management felling may be required, in creation of an expanded corridor.

For new infrastructure, field survey data will be collected to include information at compartment or sub-compartment resolution regarding species, age class, condition, and

identification of windfirm edges of woodland blocks of minimum 0.5ha, in line with the NFI. Individual trees and groups of trees, less than 0.5 ha, are scoped out. This scopes out arboricultural impact assessment following BS5837:2012 *Trees in relation to design, demolition and construction- Recommendations*, which is not applied to forestry management planning.

Consideration will be given to semi-natural ancient woodland, long-established woodland of plantation origin, native woodland survey of Scotland and the NFI. Reference will be made, where relevant, to wet woodland as a category, although forest hydrology is scoped out of the forestry chapter. The EIAR study area will consider a potential wayleave corridor up to 45m from the centreline, expanded into continuous areas of forestry, to a windfirm edge, where extended management felling is advised.

The EIAR will consider effects on forestry of uprating of existing infrastructure, new infrastructure and decommissioning of existing infrastructure.

13.6 Summary of Proposed Scope

Land use does not present a significant constraint to the Project. Within areas of New-build Overhead line, agricultural land has limited production capacity and limited capability of supporting a diverse range of crops. Agricultural land use and soils is scoped out.

Forestry is affected by the uprating and New-build Overhead line. The scope will consider effects on semi-natural woodlands and commercial forestry land. Semi-natural ancient woodland is absent from the alignments, but long-established woodland of plantation origin (referenced in the AWI) is present.

Socio-economic effects on agricultural and/or forest enterprises will not be included within a land use and forestry assessment. There will be no measurement or assessment of timber volumes.

To meet the Scottish Government's Control of Woodland Removal Policy, it may be relevant to recognise the need to compensate for forestry effects, by establishing off-site compensation areas. However, these areas will not be identified and designed as part of the EIAR. Any forestry mitigation or compensation measures will be compliant with UK Forestry Standard¹⁷⁶, referenced within a Construction Environmental Management Plan.

Table 13-1 provides a summary of the project components where the Land Use, Forestry and Agriculture EIA topic has been scoped in.

Table 13-1 Summary of Proposed Scope – inclusion of Land Use, Forestry and Agriculture Topic within EIARs

Project Component	Phase	Land Use, Forestry and Agriculture Topic Scoped in / out?	Rationale (only where topic is scoped out)
New-build overhead line	Construction	Scoped in	
	Operation	Scoped out	Impacts on forestry (beyond exemptions in relation to electricity utilities under the Forestry Act 1967) and soils are not anticipated during operation.
Up-rated overhead line (ZG Route)	Construction	Scoped out	Wayleaves will not require tree removal during construction. During operation, impacts on forestry are not anticipated to extend beyond exemptions in relation to electricity utilities under the Forestry Act 1967.
	Operation		
Up-rated overhead line (XX Route)	Construction		
	Operation		
Up-rated overhead line (XR Route)	Construction	Scoped out	Impacts on soils are not anticipated during construction and operation.
	Operation		
CB Route Removal and AA Route Ungrounding	Construction	Scoped in	
	Operation	Scoped out	Impacts on forestry (beyond exemptions in relation to electricity utilities under the Forestry Act 1967) and soils are not anticipated during operation.
Denny North Substation	Construction	Scoped out	Impacts on forestry and soils are not anticipated.
	Operation	Scoped out	
Bonnybridge Substation	Construction	Scoped out	Impacts on forestry and soils are not anticipated.
	Operation	Scoped out	

Project Component	Phase	Land Use, Forestry and Agriculture Topic Scoped in / out?	Rationale (only where topic is scoped out)
Cumbernauld Substation	Construction	Scoped in	
	Operation	Scoped out	Impacts on forestry and soils are not anticipated during operation.
Easterhouse Substation	Construction	Scoped out	Impacts on forestry and soils are not anticipated.
	Operation	Scoped out	
Wishaw Substation	Construction	Scoped out	Impacts on forestry and soils are not anticipated.
	Operation	Scoped out	

14.

Other Matters

14. Other Matters

14.1 Major Accidents and Disasters

Introduction

This chapter considers the potential for the Project to cause significant environmental effects as a result of a major accident as well as the vulnerability of the Project to major accidents or disasters which could also give rise to significant environmental effects. The Institute of Environmental Management and Assessment (IEMA) published a Primer (ref XX) providing guidance on the assessment of major accidents and disasters in relation to EIA. It defines the following:

- **Major accident:** events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the Client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.

Disaster: may be a natural hazard (e.g., earthquake) or a man-made/external, hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident. Accident and Disaster Categories For the purposes of this scoping study the major accident and disaster categories identified in Table 14-1 have been considered.

Table 14-1 Accident and Disaster Categories

Group	Categories
Natural Events	Geological Hydrological Climatological and meteorological Biological
Technological or manmade hazards	Societal Industrial and urban accidents Transport accidents Pollution accidents Utility failures Malicious attacks Engineering accidents or failures Human error Sabotage Explosion

Summary of Baseline Conditions

Baseline features relevant to accidents and disasters primarily comprise the following:

- Natural or manmade features external to the Project that present a potential hazard for example major hazard sites such as industrial installations.
- Sensitive environmental receptors at risk of likely significant effects such as communities, designated sites and habitats
- Major accident or disaster risks that could affect the Project or be exacerbated by it such as flood risk or ground instability.

Nearby Major Accident Hazard Installations

Bonnybridge Substation lies within a Pipeline Consultation Zone defined by Falkirk Council in the LDP2, the New-build Overhead Line and ZG route both also intersect the Pipeline Consultation Zone in the area between Falkirk and Denny¹⁸³. A Major Hazard Zone is located at Dennyloanhead, approximately 2.5km west of ZG route¹⁸³. The FLDP2 indicates that ZG route travels approximately 450m southwest of an area identified for infrastructure proposals/opportunities²⁹.

There are currently a number of Control of Major Accident Hazards (COMAH) regulated sites within the Study Area the majority of which are Lower Tier Operators with the exception of Inver House Distillers Limited with is Upper Tier Operator, these sites include:

- Angus Dundee Distillers plc (Coatbridge Distillery), ML5 3HH, located approximately 3.3km southwest of Route XX;
- Beam Suntory UK Limited (Righead Industrial Estate), G71 6BH, located approximately 5km south of Easterhouse Substation;
- BOC Limited (Motherwell), ML1 5LF, approximately 3.8km north of Wishaw Substation;
- Chivas Brothers Limited (Towers Road Warehouses), ML6 8NA, located approximately 380m southwest of Route XX;
- Diageo Scotland Limited (Bonnybridge Warehouses) FK4 1SH, located approximately 2.8km west of Bonnybridge Substation;
- Monarch Chemicals Limited (Cumbernauld) G67 3EN, located approximately 2.5 km north of Cumbernauld Substation; and
- Inver House Distillers Limited (Airdrie Maturation) ML6 8PL, located approximately 400m west of Route XX.

Sensitive Environmental Receptors

The Slamannan Plateau SPA and SSSI is located to the immediate south of the new-build overhead line. This site is designated for non-breeding taiga bean goose *Anser fabalis*. Clyde Valley Woods SAC and West Fannyside Moss SAC are also located within the 5km Study Area as well as various SSSIs. Further information on ecological receptors is located within Chapter 7.

¹⁸³ Major Hazards and Pipeline Consultation Zones (2024) Natalie Bushell ArcGIS. Available from: <https://www.arcgis.com/home/webmap/viewer.html?webmap=070882fe21964d4aab968c6eb5925984>

Several population centres are located in close proximity to the Project including Denny, Falkirk, Cumbernauld, Airdrie, Coatbridge, Newarthil and Wishaw. Further information on residential receptors can be found in Chapter 12.

Natural Hazards and Disasters

The Project is located within the Central Belt of Scotland, characterised by a relatively mild climate and moderate rainfall, with January being the wettest (64.1 mm average rainfall) and coldest month (4°C average temperature)¹⁸⁴. The area is susceptible to flooding and storms; winds of 100 mph were recorded across the Central Belt during Storm Eowyn in January 2025, with the additional risk of hazards from snow and rainfall. During and following dry periods, low-lying areas across the Central Belt are at a high risk of wildfires. During the winter months the area experiences snow and freezing temperatures, and weather warnings may be issued.

Assessment of Likely Significant Effects

Considering the baseline conditions any potential significant effects are mostly derived from the vulnerability of the Project to major accidents and disaster. The Project could be susceptible to extreme weather conditions from storms and flooding resulting in power outages and/or damage to equipment.

Bonnybridge substation and the ZG route lie within the Falkirk Pipeline Consultation Zone. The number of people exposed to any risk associated with the pipeline consultation zone is not anticipated to increase with the Project as the construction workforce at Bonnybridge is anticipated to be small.

Due to the presence of the COMAH regulated sites listed above, the Project could be susceptible to manmade hazards and/or pollution incidents such as explosions from neighbouring sites. All COMAH sites are required to comply with COMAH regulations and therefore should have procedures and plans in place in the event of such incidents. Any hazards associated with the COMAH sites are unlikely to be increased by the Project itself.

While there are a number of towns and settlements located within close proximity to the Project any access to members of the public will be restricted. Appropriate mitigation measures would be in place throughout construction and operation to minimise any risk to the public.

Table 14-2 uses the categories presented in Table 14-1 to identify whether the Project is either at risk of causing or increasing the risk of major accidents and disasters to environmental receptors or whether the Project itself could be affected by major accidents or disasters. A further assessment of those identified as a risk are described below.

¹⁸⁴ Climate & Weather Averages in Central Belt, Scotland, United Kingdom (2025), Time and Date AS 1995 – 2025 [Online]. Available from: <https://www.timeanddate.com/weather/@7281598/climate>

Table 14-2 Assessment of Potential Accidents and Disasters

Group	Categories	Could the Project cause or increase the risk of major accidents and disasters	Could the Project be affected by major accidents and disasters
Natural Events	Geological	No, the Project is not a source of hazard that could increase geological natural events occurring.	The Project is not in an area of significant seismic activity. Chapter 9 considers any potential effects as it relates to ground conditions, for example peat slide risk.
	Hydrological	No, the Project is not a source of hazard that could increase Hydrological natural events occurring.	The Project is not considered to be a high risk of flooding. Those components (substations) that may be at elevated risk will be subject to a Flood Risk Assessment to inform design of appropriate mitigation.
	Climatological and meteorological	No, the Project is not likely to increase Climatological or meteorological natural events occurring.	Yes, the Project could be susceptible to severe weather which could result in power outages. The Project is designed and maintained in accordance with relevant standards including those set out in SPEN's Climate Resilience Strategy to mitigate climate-related risks.
	Biological	No, any biological risk is limited to the spread of disease associated with construction activities. Good biosecurity measures	No, the Project has no component of biological risk.

Group	Categories	Could the Project cause or increase the risk of major accidents and disasters	Could the Project be affected by major accidents and disasters
		during construction would reduce the risk of disease spread.	
Technological or manmade hazards	Societal	There is a small risk that public disorder and disruption can take place in response to the planning of infrastructure projects.	There is a small risk that public disorder and disruption can take place at large infrastructure projects and could affect the construction and operation of the Project.
	Industrial and urban accidents	Yes, there are hazards associated with overhead line infrastructure however any risks will be mitigated and will need to comply with health and safety and environmental legislation.	Yes, there are hazards associated with overhead line infrastructure however any risks will be mitigated and will need to comply with health and safety and environmental legislation.
	Transport accidents	Transport accidents are accounted for under Chapter 10.	No
	Pollution accidents	Pollution accidents are accounted for under Chapter 8 and 9. The Project will be designed to minimise and mitigate against any risk of potential pollution incidents.	No
	Utility failures	No	There is the possibility that the Project could be subject to utility failures however, embedded mitigation would ensure security of supply.

Group	Categories	Could the Project cause or increase the risk of major accidents and disasters	Could the Project be affected by major accidents and disasters
	Malicious attacks	No	The Project could be a possible target from malicious attacks as it seen as national infrastructure, however, robust plans are in place both at the government and system operator level to ensure in the unlikely event of an attack on infrastructure that the network can be reconfigured to ensure security of supply.
	Engineering accidents or failures	While any engineering project cannot be said to carry no risk, design, and health and safety regulations, industry good practice and a stringent risk management process can ensure that the design avoids any risk of engineering accidents or failures.	No
	Human error	Design, and health and safety regulations, industry good practice and a stringent risk management process work to eliminate risks presented by human error.	Design, and health and safety regulations, industry good practice and a stringent risk management process work to eliminate risks presented by human error.
	Sabotage	No	There is the potential for sabotage from cyber attacks or malicious attacks.

Group	Categories	Could the Project cause or increase the risk of major accidents and disasters	Could the Project be affected by major accidents and disasters
			Robust plans are in place at a government and a system operator level to manage vulnerability to attacks and ensure in the unlikely event of sabotage that the network can be reconfigured to ensure security of supply.
	Explosion	There are flammable materials within substations, however, these are designed to ensure that in the unlikely event of a fire they are contained.	As above should the Project or a component of it be damaged by explosion there are robust plans in place to ensure that the network can be reconfigured to ensure security of supply.

Considering the local and regional environmental setting, major accidents and disasters relevant to the Project include:

- extreme weather events, such as:
 - flooding
 - wildfire
 - extreme winds
 - extreme cold leading to significant snowfall or icing of apparatus / equipment
- fire, collapse or explosion within infrastructure associated with the Project (resulting from operational malfunction, traffic accidents, or extreme weather)
- release of significant volumes of polluting substances from infrastructure associated with The Project (resulting from operational malfunction, traffic accidents, or extreme weather)
- mass movement associated with ground instability

Potential Impacts

The hazards outlined above could give rise to the following impacts:

- power cuts or electricity outages due to damage to the Project's electricity transmission infrastructure
- damage to nearby habitat or protected areas resulting from release of pollutants, fire or explosion associated with the Project infrastructure
- pollution of the water environment arising from release of pollutants associated with the project infrastructure
- injury to members of the public arising from fire, explosion or falling ice associated with the Project Infrastructure.
- flooding of property, the Project Infrastructure (or other essential infrastructure)

Likely Significant Effects

Effects arising from power cuts and electricity outages

Crisis management and continuity plans are in place across SP Energy Networks. These are tested regularly and are designed for the management of, and recovery from, significant energy infrastructure failure events. Where there are material changes in infrastructure (or the management of it) additional plans are developed.

In the event of an unplanned power cut, significant effects are considered unlikely. Impacts are likely to be short term. Essential services (e.g. medical facilities), are also likely to have some form of backup generation and are therefore of a low sensitivity to such impacts.

Owing to the resilience of wider electricity transmission infrastructure and facilities reliant on it, it is not considered the magnitude of impacts arising from electricity outages would be sufficient to give rise to a significant effect on the local population and communities.

Effects arising from fire, collapse, explosion and falling ice

The Principal Designer would be required to fully assess risks and mitigate these risks as appropriate during pre-construction, under the requirements of the Construction (Design and Management) Regulations (2015).

Various other risk management legislation will apply to The Project infrastructure including:

- the Health and Safety at Work etc. Act 1974
- the Electricity Safety, Quality and Continuity Regulations 2002 and
- all relevant design and technical specifications which require consideration of hazards

The above includes requirements for safety to be considered at all stages of the project design.

As part of the detailed project design, risk assessments will be undertaken including HAZID (Hazard Identification) and HAZOP (Hazard and Operability) studies. These will consider

maintenance and operational activities. Operational safety procedures and processes will be in place.

It is considered that accordance with the above legislation and responsibilities would ensure these impacts would not be of a magnitude that would give rise to a significant effect.

Effects arising from flooding

Effects arising from flooding will be covered within the Water Environment EIAR chapter.

Effects arising from pollution of the water environment

Due to the nature of the Project, it is considered that the magnitude of any pollution incident would not be of a scale sufficient to constitute a major accident. The Project will not involve frequent handling, storage and processing of large volumes of hazardous or polluting substances.

It is also considered that operational and construction controls, mitigation and monitoring (where appropriate) will ensure impacts of any pollution event would not give rise to a significant effect.

Effects on the water environment will be covered within the Water Environment EIAR chapter.

Summary

Significant effects arising from the vulnerability of the Project to major accidents and/or disasters will be scoped out of the EIA.

14.2 Human Health

Introduction

The EIA Regulations require the consideration to the risk to human health arising from a development. This requirement can be assessed by a Human Health Impact assessment.

Summary of Baseline Conditions

The health profile of the Baseline Study Area (Falkirk and North Lanarkshire) has been determined with the Scotland average used as a comparator:

- Age – using Scottish Census data on age demographics from 2011¹⁸⁵ and 2022¹⁸⁵.
 - 2011 - 0-15 year olds – Baseline study area is 18.9% and is greater than the Scotland average of 17.3%;
 - 2022 – 0-15 year olds – Baseline study area is 17.5% and is lower than Scotland average of 16.4%. Both showing a decrease since 2011;
 - 2011 – 16-64 year olds – Baseline study area is 65.8% and is similar to the Scotland average of 65.9%;

¹⁸⁵ Scotland's Census 2022 (2022), National Records of Scotland <https://www.scotlandscensus.gov.uk/>

- 2022 – 16-64 year olds – Baseline Study Area is 64.1% and is similar to Scotland average of 63.6%. Both showing a decrease since 2011;
- 2011 - 65+ year olds – Baseline Study Area is 15.3% and is lower than Scotland average of 16.8%.
- 2022 – Baseline Study Area is 18.4% and is lower than Scotland average of 20.0%. Both showing an increase since 2011 and indicates that the Baseline Study Area exhibits an aging population, a trend reflected across Scotland.
- Economic activity, qualifications and employment – Data on economic activity, qualifications and employment by industry for the Baseline Study Area can be found in Chapter 12.
- Deprivation – using 2020 SIMD as a relative measure of deprivation. The data shows that on average, 9.9% of the Baseline Study Area's datazones are ranked in d1, 15.6% in d2, and 13.5% in d3. This highlights the Baseline Study Area is moderately deprived, with 39.0% of datazones ranking in the top 3 most deprived deciles. People living in areas of higher deprivation are considered more sensitive to potential changes.
- General health – The area has slightly lower percentages of individuals self-reporting "very good" health (46.1%) and "good" health (30.4%) compared to Scotland overall of 46.1% and 30.1% respectively. People considered to have lower health are considered more sensitive to potential changes.
- Disability and long-term illness - The Baseline Study Area has a slightly higher proportion of individuals whose day-to-day activities are "limited a lot" (12.6%) compared to Scotland overall (10.8%). However, the percentage of individuals whose day-to-day activities are "not limited" (74.2%) is slightly lower in the Baseline Study Area compared to Scotland (75.9%). This indicates a marginally higher prevalence of disability-related limitations.
- Performance on different health indicators gathered by the Scottish Health Survey 2023 (data collected between 2019-2023) vary widely in the baseline study area compared with the Scottish average:
 - 15.5% of individuals report having a cardiovascular condition, which is slightly lower than the Scottish average of 16.0%;
 - 30.5% of individuals report life satisfaction levels above the mode (extremely satisfied), slightly lower than the Scottish average of 33.0%. Similarly, a higher proportion in the Study Area (42.0%) report life satisfaction levels below the mode (extremely dissatisfied to average), compared to 37.0% in Scotland;
 - 7.5% of individuals have been diagnosed with diabetes, slightly higher than the Scottish average of 7.0%;
 - 15.0% of individuals are current smokers, which is in line with the Scottish average of 15.0%;
 - 15.5% of individuals report alcohol consumption over six / eight units, slightly higher than the Scottish average of 15.0%;
 - 31.5% of individuals are classified as obese, which is higher than the Scottish average of 29.0%; and

- 22.5% of individuals report engaging in very low physical activity, higher than the Scottish average of 20.0%. Similarly, Fewer individuals in the Baseline Study Area (61.5%) meet physical activity recommendations compared to Scotland (65.0%).
- Access to Social Infrastructure, Community and Recreational Facilities – Chapter 12 details key receptors including community facilities, employment sites and healthcare facilities etc.
- Core paths – while a number of core paths are located within and in close proximity to the Project any impacts are likely to be temporary.

Potential Impacts

In accordance with IEMA guidance health is influenced by a range of factors, termed the “wider determinants of health”¹⁸⁶. Determinants of health span the bio-physical (air quality, water quality and noise), social, behavioural, economic and institutional (health and social care services) factors.

IEMA guidance suggests that if a change in a “wider determinant of health” is likely it should be scoped into the human health assessment. The assessment must present the ‘likely significant’ human health effects of the Project. At the scoping stage, there are uncertainties, therefore scoping identifies whether health effects are ‘potentially significant’ or not.

The wider determinants of health are considered in the table below with their relevance to the project and whether they are scoped in or out.

Table 14-3 Assessment of the wider determinants of human health

Wider determinants of human health	Scoped in or out and Rationale
Physical activity;	Scoped out of all Project components - Physical activity effects relate most directly to ‘open space, leisure, and play’ and ‘transport modes, access, and connections’, so are captured within the assessment of those determinants, as suggested by IEMA guidance.
Risk taking behaviour;	Scoped out of all Project components - Due to the nature of the Project, IEMA considerations such as alcohol use, cigarette use, drug use, gambling and communicable diseases are unlikely to be affected by the Project
Transport modes, access, and connections;	This determinant is scoped into the assessment for the new-build overhead line and the uprated overhead line but is addressed within Chapter 12 under assessment of Core Path impacts. The Project will be limited in its impact on

¹⁸⁶ Effective Scoping of Human Health in Environmental Impact Assessment (2022), Institute of Environmental Management and Assessment [iema-eia-guide-to-effective-scoping-of-human-health-nov-2022.pdf](https://www.iema.org.uk/eia-guidance-to-effective-scoping-of-human-health-nov-2022.pdf)

Wider determinants of human health	Scoped in or out and Rationale
	accessibility in relation to transport as closure on the road network is not anticipated and will be restricted to the presence of construction vehicles during construction and staff maintenance during operation. Therefore Chapter 12 will be limited to the assessment of potential impacts on the accessibility of recreational routes. For a detailed evaluation and analysis, including methodology, key findings, and conclusions, please refer to Chapter 12.
Community safety;	Scoped out of all Project components - Due to the nature of the Project, there are no significant effects expected in relation to community safety through impacts on crime.
Social participation, interaction and support;	Scoped out of all Project components - The Project is unlikely to affect how the project affects opportunities for community participation and interaction, and for social and family support directly or indirectly to justify its inclusion as a determinant.
Education and training;	This determinant is scoped into the assessment but is addressed within Chapter 12 under assessment of economy and employment impacts. For a detailed evaluation and analysis, including methodology, key findings, and conclusions, please refer to Chapter 12.
Employment and income;	This determinant is scoped into the assessment but is addressed within Chapter 12 under assessment of economy and employment impacts. For a detailed evaluation and analysis, including methodology, key findings, and conclusions, please refer to Chapter 12.
Climate change mitigation and adaptation;	Scoped out of all Project components - The Project is unlikely to affect climate altering pollutant emissions and climate adaptation strategies directly or indirectly to justify its inclusion as a determinant.
Air quality;	Scoped out of all Project components as addressed in Chapter 14 Section 3 - The Project would not result in significant adverse effects on air quality during the construction or operational phases.

Wider determinants of human health	Scoped in or out and Rationale
Water quality or availability;	Scoped out of all Project components - Impacts on private water supplies are assessed in Chapter 8 Water Environment and is therefore scoped out of this chapter.
Land quality;	Scoped out of all Project components - As per IEMA guidance, Chapter 9 Geology and Soils will be kept under review and a health assessment will only scope this in if there are significant effects to the soil environment that relate to human receptors. The Project is predominantly located in rural areas where the likelihood of encountering contaminated land is low and could be effectively controlled through pre-construction investigations, remediation and mitigation where required. There are no significant effects anticipated relating to human health.
Noise and vibration;	Scoped out of all Project components – a noise assessment will be undertaken in Chapter 11 which will identify any potential significant noise effects.
Health and social care services;	Scoped out of all Project Components –It is unlikely to affect the capacity, accessibility or quality of health and social care services. Most of the Project is located rurally and is distant from health and social services but not withstanding in urban areas the Project is not anticipated to constrain, restrict or limit access to Health and Social care services.
Built environment;	Scoped out of all Project components - The impacts relating to how the Project affects the built features of the environment are to be considered within assessment of amenity and severance impacts on local facilities within Chapter 12. No major effects that contribute to health are anticipated.
Open space, leisure and play;	Scoped out of all Project components – Impacts to core paths are only likely to be temporary – the assessment will be conducted in the Chapter 12 assessment.
Community identity, culture, resilience and influence;	Scoped out of all Project components - The Project is unlikely to affect the way people feel about their community, including opportunities to contribute to a positive community identity, sense of belonging and

Wider determinants of human health	Scoped in or out and Rationale
	sense of control directly or indirectly to justify its inclusion as a determinant.
Wider societal infrastructure and resources; and	Scoped out of all Project components - The impacts relating to how the Project affects infrastructures on which society depends for good population health are to be considered within assessment of amenity and severance impacts on local facilities within Chapter 12. No major effects that contribute to health are anticipated.
Radiation	Scoped out of all Project components - The impacts of exposure to electrical infrastructure has been considered in the Project design, and any major effects perceived are to be considered within the assessment of amenity impacts on local facilities within Chapter 12. No major effects that contribute to health are anticipated. Furthermore, SPEN will be producing a report that addresses electromagnetic fields (EMF's) in relation to electrical equipment and infrastructure.

Likely Significant Effects

The Project has limited potential to impact Human Health during the operational or construction phase. The health effects on water quality, land quality, noise and vibration are covered in Chapter 8, Chapter 9 and Chapter 11 respectively and health effects relating to Transport modes, access, and connections, Education and training, and Employment and income are covered by Chapter 12. Notwithstanding it is considered that the nature of the construction activities are short-term and unlikely to give rise to potentially significant adverse effects.

Issues Scoped Out

As above, any activities which could otherwise affect human health are addressed in other topics. As such the topic of Human Health has been scoped out of the EIA and no human health impact assessment is proposed as part of the EIA Report.

14.3 Air Quality

Introduction

This chapter sets out the proposed scope of the environmental assessment for air quality, which will consider the potential for effects on human and ecological receptors that may arise from the Project.

This chapter should be read in conjunction with Chapter 7, Chapter 10 and 14.2 Human Health of this Chapter.

Baseline Conditions

North Lanarkshire Council (NLC) currently has one declared Air Quality Management Area (AQMA) for PM₁₀, in Motherwell Town Centre¹⁸⁷. FC also currently has one declared AQMA for NO₂, in Falkirk Town Centre¹⁸⁸. The nearest of these AQMAs is located 3.2km from the new-build overhead line. Both councils have recently revoked several AQMAs within the last year, due to more recent monitoring data suggesting that the relevant Air Quality Objectives (AQO) are now being met at those locations, where previously they weren't.

Likely Significant Effects

The Project has limited potential to impact the Air Quality; there is a potential to give rise to some localised and temporary construction related air quality impacts associated with dust (e.g. passage of vehicles along access tracks) and construction plant and traffic exhaust emissions. However, the nature of the construction activities is that impacts on air quality would be relatively short term (i.e. limited to the construction period) and intermittent, and unlikely to give rise to potentially significant adverse effects.

The potential for nuisance effects on residential or recreational amenity would be limited and would be controlled in through implementation of a Construction Environmental Management Plan (CEMP).

There is no potential for significant operational air quality impacts. It is unlikely that the impacts described above would have a significant effect on local air quality.

Issues Scoped out

The Project would not result in significant adverse effects on air quality during the construction or operational phases. The Project would contribute to connecting renewable electricity generation capacity to the transmission network and potentially enhancing electricity security, in turn displacing emissions associated with fossil fuel-based electricity generation elsewhere. As such, this issue is scoped out of the EIA and no assessment of air quality is proposed as part of the EIA Report.

14.4 Climate Change

Introduction

This section sets out the proposed approach to the potential impacts of the Project on climate change during construction and operation.

Summary of Baseline Conditions

The original Climate Change (Scotland) Act 2009 required 80% reductions in Greenhouse Gas (GHG) emissions in Scotland by 2050, compared to the 1990-1995 baseline¹⁸⁹. The bill was amended in 2019, changing the target for reducing all "greenhouse gas emissions" to 100% by 2045¹⁹⁰. The Scottish Government has since passed the Climate Change (Emissions Reductions Targets) (Scotland) Act 2024 which has shifted the legislative framework from

¹⁸⁷ Air Quality Management Areas (2025) North Lanarkshire Council <https://www.northlanarkshire.gov.uk/pests-and-pollution/pollution/air-quality/air-quality-management-areas>

¹⁸⁸ Air Quality (2025) Falkirk Council <https://www.falkirk.gov.uk/environmental-policy/air-quality/air-quality-management-areas>

¹⁸⁹ Climate Change (Scotland) Act 2009. Scottish Government, 2009. <https://www.legislation.gov.uk/asp/2009/12/contents>

¹⁹⁰ Climate Change (Emissions Reductions Targets) (Scotland) Act 2019 (November 2019), Scottish Government, <https://www.legislation.gov.uk/asp/2019/15>

annual targets to five-year carbon budgets¹⁹¹. The first Scotland Carbon Budget has not been published however advice from the Climate Change Committee recommends that the Scottish Government set its carbon budgets at the following annual average levels of emissions¹⁹²:

- 57% lower than 1990 levels for the First Carbon Budget (2026 to 2030).
- 69% lower than 1990 levels for the Second Carbon Budget (2031 to 2035).
- 80% lower than 1990 levels for the Third Carbon Budget (2036 to 2040).
- 94% lower than 1990 levels for the Fourth Carbon Budget (2041 to 2045)

The UK climate change risk assessment¹⁹³ details some of the hazards related to climate change of most relevance to the Project. The hazards include:

- increased precipitation (heavier rainfall) leading to potential flooding and erosion;
- higher extreme temperatures leading to risks associated with wildfire or risks to the grid connection;

increased severity of storms with the potential for damage to plant and infrastructure. In the context of the EIA process, climate change is required to be assessed both in relation to the contribution of the Project to increasing the nature and magnitude of greenhouse gas emissions and the vulnerability of the Project to climate change.

Likely Significant Effects

The Project is a nationally significant development under the terms of NPF4 and will play an important role in facilitating the transition to net zero.

IEMA guidance¹⁹⁴ indicates GHG emissions should be considered as significant; however, in this case it is anticipated that the Project will indirectly result in an overall net-reduction/saving of GHG emissions.

Construction of the Project is likely to contribute to GHG emissions from vehicles during construction and the carbon footprint (embodied carbon) of the materials required to build it, however, in the long term the Project will provide increased capacity on the electricity network and facilitate the connection of renewable energy sources resulting in a long-term reduction in GHG emissions. As a result, the Project is not considered to result in significant effects on GHG emissions and therefore it is proposed to scope this out of the EIA.

Climate Change and Hazard Vulnerability

The vulnerability of the Project to climate change induced hazards such as flooding, extreme temperatures and wildfire is considered to be low on the basis that the design (which will be described in the EIA Report) will specifically include embedded mitigation measures in line

¹⁹¹ Climate Change (Emissions Reduction Targets (Scotland) Act 2024 (November 2024) Scottish Government <https://www.parliament.scot/bills-and-laws/bills/s6/climate-change-emissions-reduction-targets-scotland-bill>

¹⁹² Scotland's Carbon Budgets. Advice for the Scottish Government. The Climate Change Committee, 2025 <https://www.thecc.org.uk/publication/scotlands-carbon-budgets/>

¹⁹³ UK Climate Change Risk Assessment 2017 (January 2017) HM Government https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584281/uk-climate-change-risk-assess-2017.pdf

¹⁹⁴ IEMA (2022). Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022), IEMA https://www.iema.net/media/xmgpook/2022_iema_greenhouse_gas_guidance_eia.pdf.

with SPEN's Climate Resilience Strategy to ensure that significant effects on the Project are avoided or reduced to a tolerable level. An assessment of the vulnerability of the Project to climate change hazards is not proposed.

Issues Scoped out

The Project would not result in significant adverse effects on or from climate change during the construction or operational phases. The Project would contribute to connecting renewable electricity generation capacity to the transmission network, in turn displacing emissions associated with fossil fuel-based electricity generation elsewhere. As such, this issue is scoped out of the EIA and no assessment of climate change is proposed as part of the EIA Report.

18.

Summary of Proposed EIA Scope

15. Summary of Proposed EIA Scope

15.1 Introduction

This Scoping Report has considered the potential for likely significant effects with reference to the factors set out in Regulation 4(3) and Schedule 4 of the EIA Regulations. Based on a review of the baseline environmental sensitivity and the nature /scale of the Proposed Development, there are several topics or components of topics that are considered to be not significant and are proposed to be scoped out from further consideration within the EIA process. Table 15-1 Summary of Proposed EIA Scope provides a summary and lists each topic, and the elements scoped in and out from further assessment. For further information on which elements of the project have been scoped in and out please refer to chapters 4 to 17.

15.2 Proposed Scope of EIA

Table 15-1 Summary of Proposed EIA Scope

Project Component	Phase	Landscape and Visual	Cultural Heritage	Biodiversity	Water Environment	Ground Conditions	Traffic and Movement	Noise and Vibration	Socio Economics	Land Use, Forestry and	Air Quality inc. dust	Climate Change	Human Health	Major Accidents
New-build overhead line	Construction	X	X	X	X	X	X	X	X	X	O	O	O	O
	Operation	X	X	X	X	O	O	O	O	O	O	O	O	O
Uprated overhead line (ZG Route)	Construction	O	X	X	X	O	X	X	X	O	O	O	O	O
	Operation	O	O	X	X	O	O	O	O	O	O	O	O	O
Uprated overhead line (XX Route)	Construction	O	X	X	X	O	X	X	X	O	O	O	O	O
	Operation	O	O	X	X	O	O	O	O	O	O	O	O	O
Uprated overhead line (XR Route)	Construction	O	X	X	X	O	X	X	X	O	O	O	O	O
	Operation	O	O	X	X	O	O	O	O	O	O	O	O	O
CB Route Removal and AA Route Ungrounding	Construction	X	X	X	X	X	X	X	X	X	O	O	O	O
	Operation	X	O	X	X	O	O	O	O	O	O	O	O	O
Denny North Substation	Construction	O	X	X	X	X	X	X	O	O	O	O	O	O
	Operation	O	O	X	X	O	O	O	O	O	O	O	O	O
Bonnybridge Substation	Construction	X	X	X	X	X	X	X	O	O	O	O	O	O
	Operation	X	O	X	X	O	O	O	O	O	O	O	O	O
Cumbernauld Substation	Construction	X	X	X	X	X	X	X	X	X	O	O	O	O
	Operation	X	O	X	X	O	O	O	O	O	O	O	O	O

Project Component	Phase	Landscape and Visual	Cultural Heritage	Biodiversity	Water Environment	Ground Conditions	Traffic and Movement	Noise and Vibration	Socio Economics	Land Use, Forestry and	Air Quality inc. dust	Climate Change	Human Health	Major Accidents
Easterhouse Substation	Construction	O	X	X	X	O	X	X	X	O	O	O	O	O
	Operation	O	O	X	X	O	O	O	O	O	O	O	O	O
Wishaw Substation	Construction	O	X	X	X	X	X	X	X	O	O	O	O	O
	Operation	O	O	X	X	O	O	O	O	O	O	O	O	O

X – scoped in, O – scoped out

Appendix A Figures

Appendix B Gazetteer

